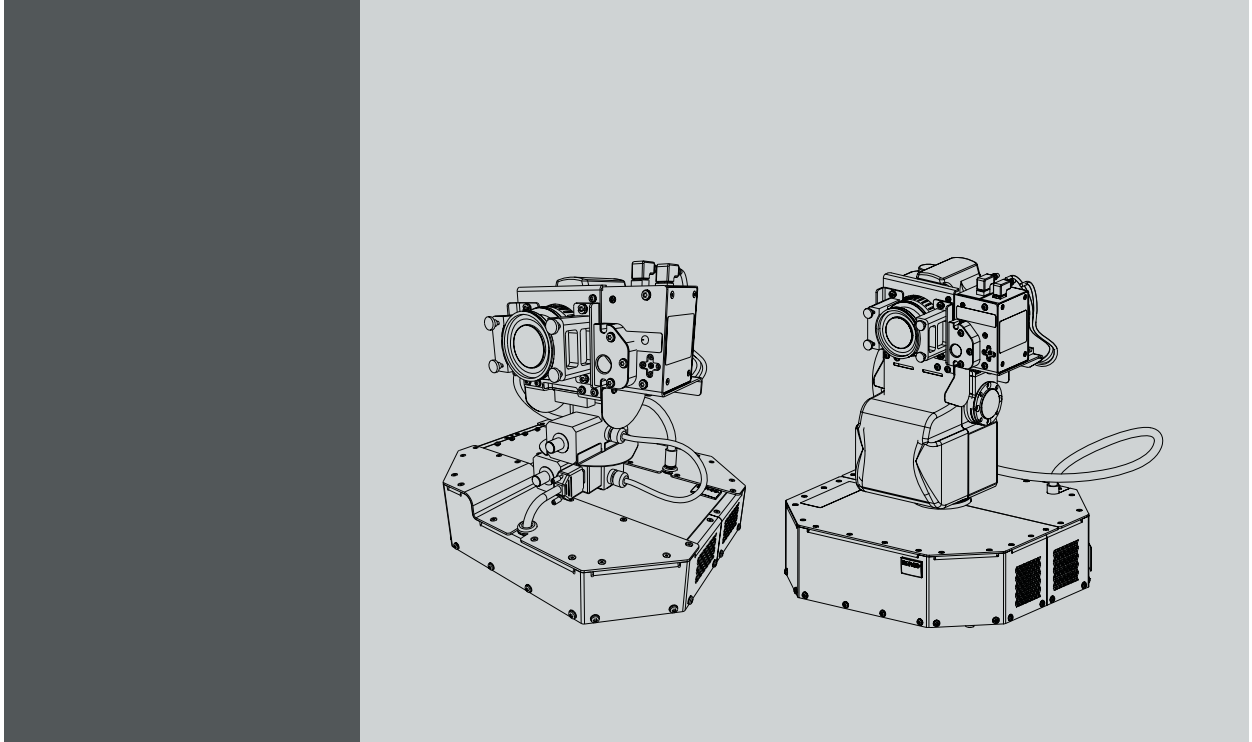


AutoAlignment Head Gen II



User and Installation guide

R9843500
R9843501

Product revision

Software version: 3.11

Factory: Barco nv Advanced Visualization Systems

Noordlaan 5, B-8520 Kuurne

Phone: +32 56.36.82.11

Fax: +32 56.36.84.86

Support: www.barco.com/esupport

Visit us at the web: www.barco.com

Changes

Barco provides this manual 'as is' without warranty of any kind, either expressed or implied, including but not limited to the implied warranties or merchantability and fitness for a particular purpose. Barco may make improvements and/or changes to the product(s) and/or the program(s) described in this publication at any time without notice.

This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this publication; these changes are incorporated in new editions of this publication.

The latest edition of Barco manuals can be downloaded from the Barco web site www.barco.com or from the secured Barco web site <https://my.barco.com>.

Copyright ©

All rights reserved. No part of this document may be copied, reproduced or translated. It shall not otherwise be recorded, transmitted or stored in a retrieval system without the prior written consent of Barco.

Barco XDS Software End-User License Agreement (EULA)

PLEASE READ THIS DOCUMENT CAREFULLY BEFORE OPENING OR DOWNLOADING AND USING SOFTWARE OR HARDWARE PROVIDED TO YOU BY BARCO AS IT CONTAINS THE TERMS AND CONDITIONS BY WHICH BARCO OFFERS TO LICENSE THE SOFTWARE. BY OPENING THE SOFTWARE PACKAGE, OR USING THE HARDWARE IN WHICH THE SOFTWARE IS EMBEDDED, YOU AGREE TO BECOME BOUND BY THE TERMS OF THIS AGREEMENT. The Software as supplied by BARCO is licensed, not sold to you, on a non-exclusive basis for use only under the terms of this license, and BARCO reserve all rights not expressly granted to you. You own the disk(s) on which the Software is provided, but the Software is owned and copyrighted by BARCO or by third party suppliers. Your license confers no title or ownership and is not a sale of any rights in the Software or its documentation.

By installing the Software, either as initial version or as an upgrade, update, patch or enhancement of a prior release, this Software License shall supersede any terms and conditions previously agreed upon (whether or not in writing) between Barco and you with respect to the subject matter of this Software License and such previous terms shall from the date hereof cease to have any force or effect; provided, however that this Software License shall not be construed as a renunciation, discharge or waiver of any right or remedy provided in any terms and conditions previously agreed upon with respect to a failure of either party to perform any of its obligations under any terms and conditions previously agreed upon.

Software Specifications

The Software contains 2 main products:

- - XDS RACU (with Auto Alignment);
- - XDS Display Wall Software.

Software License Terms

1. This Software License is between you and BARCO NV, a corporation organized and existing under the laws of Belgium registered under number BE 0473.191.041, Commercial Companies' Register of Kortrijk, having its registered office President Kennedypark, 35 at B-8500 Kortrijk, Belgium ("Barco") for the use of the Software.
You hereby undertake to inform all Authorized Users of the terms of this Software License and to bind all Authorized Users to accept all such terms of this Software License as applies to them. Barco grants you a limited, non-exclusive, non-assignable, non-transferable license (without the right to grant sublicenses) and right to install the Software on your network for use by you and/or any Authorized User(s). You agree to notify Barco prior to moving the Software to any network other than the originally installed network.
2. The Software is licensed to you as a network-enabled product. The Software component parts must not be separated or replicated in any manner. You and Authorized Users are entitled to use the Software for the purposes and in the manner set out in this EULA (and documentation), but neither you nor any Authorized User are entitled to: (i) sell or grant a security interest in the Software to other parties in any way, or to rent, lease or sub-license the Software to others without the express prior written consent of Barco; or (ii) exploit the Software or any of its component parts for any commercial purpose, other than use by you and/or Authorized Users of the Software.

3. Barco shall hold you harmless and indemnify you from and against direct damages, losses and expenses arising from infringement or alleged infringement of any patent, trademark or copyright of such third party by the license and the right to install the Software as permitted by this Software License and defend and settle at its sole expense any claim, action, suit or proceeding brought against you, provided that (i) you promptly notify Barco in writing after a claim has been asserted against you or the commencement of any claim, action, suit or proceeding, and (ii) Barco shall assume sole control of the defense and any settlement negotiations related to any claim, action, suit or proceeding, and (iii) you shall not negotiate, settle or compromise any claim, action, suit or proceeding without the prior written consent of Barco and (iv) you, at your cost, shall cooperate with Barco and provide assistance and support, as may reasonably be required by Barco, in connection with the defense and any settlement negotiations related to any claim, action, suit or proceeding. Barco shall have no indemnity obligation for any Software, or any portion thereof, (i) that is based on specifications, drawings, models or other data furnished by you or, (ii) that is not provided by Barco or, (iii) that is modified, in spite of the prohibition for you to modify the software or, (iv) to the extent that you continue allegedly infringing activity after having been provided modifications that avoid the alleged infringement, or (v) where the use of the Software, or the combination of thereof with other Software, processes or materials or the distribution thereof rather than the Software itself is the primary cause of an alleged infringement. In case it has been determined by a finally awarded judgment that Barco infringed or misappropriated such third party rights or earlier, at Barco's discretion, it may, at its option and cost, (i) modify the Software in such a way that it shall not infringe upon or misappropriate the rights of the third party or (ii) obtain for you a license or other right to use the rights allegedly infringed or (iii) replace the Software in question with non-infringing Software. The remedies set forth in this paragraph shall constitute your sole and exclusive remedy and Barco's sole and exclusive liability for a third party claim that the Product infringes or misappropriates any intellectual property right of a third party.
4. Barco (and Barco's licensors, as appropriate) retain ownership of all intellectual property rights in the Software and any copies you or any Authorized User may make of such Software. The Software is protected by national copyright laws, international copyright treaties and conventions, and other applicable laws. All rights not expressly licensed to you in this Software License are reserved to Barco and Barco's licensors, as appropriate. The Software contains certain other licensed materials and Barco's licensors may protect their rights in the event of any violation of this Software License. Neither you nor any Authorized User may, whether in whole or in part, copy, translate, reverse engineer, derive source code from, modify, disassemble, decompile, create derivative works based on the Software, or remove any proprietary notices or labels on the Software, save as may be permitted by law or this Software License, without the prior consent, in writing, of Barco.
- This software uses:
- the OpenSSL library, (c) 1998-2008 The OpenSSL Project. The full license can be found in OpenSSLWin32License.txt;
 - the Crypto++ library, (c) 1995-2009 by Wei Dai. The full license can be found in cryptopplicense.txt
 - the Ogg Vorbis libraries, (c) 2002-2008 the Xiph.org Foundation. The full license can be found in oggvorbislicense.txt;
 - the OpenCV library, (C) 2000-2006, Intel Corporation. The full license can be found in OpenCVLicense.txt
- This software is based in part on the work of the Qwt project (<http://qwt.sf.net>).
5. The duration of this Software License will be from the date of your acceptance (as set forth above) of the Software, with no termination date, unless otherwise specified. You may terminate this Software License at any time by destroying all copies of the Software then in your possession and returning all associated materials and documentation, to Barco or the appointed Barco reseller that sold or provided these to you. Barco may terminate this Software License forthwith by informing you at any time if you and/or any Authorized User are in breach of any of the Software License's terms.
6. YOU UNDERSTAND THAT THE SOFTWARE IS BEING PROVIDED TO YOU "AS IS". BARCO DOES NOT MAKE NOR INTENDS TO MAKE ANY WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED AND SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY FITNESS, FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT OF INTELLECTUAL PROPERTY AND DOES NOT WARRANT THAT THE SOFTWARE WILL BE FREE FROM ERRORS OR THAT SUCH ERRORS WILL BE CORRECTED BY BARCO AND YOU ARE SOLELY RESPONSIBLE FOR ALL COSTS AND EXPENSES ASSOCIATED WITH RECTIFICATION, REPAIR OR DAMAGE CAUSED BY SUCH ERRORS.
- YOU ALSO ACKNOWLEDGE AND AGREE THAT:**
- BARCO ACCEPTS NO LIABILITY FOR ANY DAMAGES, LOSSES OR CLAIMS YOU OR ANY THIRD PARTY MAY SUFFER AS A RESULT OF YOUR USE OF THE SOFTWARE, AND YOU HEREBY AGREE TO INDEMNIFY, KEEP INDEMNIFIED, DEFEND AND HOLD HARMLESS BARCO AND BARCO'S AFFILIATES AND SUBSIDIARIES FROM AND AGAINST ANY AND ALL ACTIONS, PROCEEDINGS, LIABILITY, LOSS, DAMAGES, FEES AND COSTS (INCLUDING ATTORNEYS' FEES), AND OTHER EXPENSES INCURRED OR SUFFERED BY BARCO ARISING OUT OF OR IN CONNECTION WITH ANY BREACH BY YOU OF THE TERMS OF THIS SOFTWARE LICENSE. TO THE MAXIMUM EXTENT PERMITTED BY LAW, IN NO EVENT WILL BARCO BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL OR CONSEQUENTIAL LOSS OR DAMAGES OF ANY KIND WHICH MAY ARISE OUT OF OR IN CONNECTION WITH THE SOFTWARE, THIS SOFTWARE LICENSE OR THE PERFORMANCE OR PURPORTED PERFORMANCE OF OR FAILURE IN THE PERFORMANCE OF BARCO'S OBLIGATIONS UNDER THIS SOFTWARE LICENSE OR FOR ANY ECONOMIC LOSS, LOSS OF BUSINESS, CONTRACTS, DATA, GOODWILL, PROFITS, TURNOVER, REVENUE, REPUTATION OR ANY LOSS ARISING FROM WORK STOPPAGE, COMPUTER FAILURE OR MALFUNCTION OF THE SOFTWARE AND ANY AND ALL OTHER COMMERCIAL DAMAGES OR LOSSES WHICH MAY ARISE IN RESPECT OF USE OF THE SOFTWARE, EVEN IF BARCO HAS BEEN ADVISED OF THE POSSIBILITY OF THEIR OCCURRENCE; AND
7. You shall treat as confidential all information obtained from the other pursuant to this Software License which is marked 'confidential' or the equivalent or has the necessary quality of confidence about it and shall not divulge such information to any persons without Barco's prior written consent provided that this Paragraph 7 shall not extend to information which was rightfully in the possession of you prior to the commencement of the negotiations leading to this Software License, which is already public knowledge or becomes so at a future date (otherwise than as a result of a breach of this paragraph 7), is required to be disclosed by law or which is trivial or obvious. You are aware of and ensure to comply with the provisions of this paragraph 7. The foregoing obligations as to confidentiality shall survive any termination of this Software License.

8. You agree with and fully accept the following limited service and support statements. Barco may limit or terminate any Support Services being provided if you use any Support Services in an abusive or fraudulent manner, as determined by Barco in its reasonable discretion. Resale, assignment and transfer of ownership are strictly prohibited and will be grounds for termination of the License Agreement, unless otherwise agreed in writing. A single support incident will be restricted to support on an issue that focuses on one aspect of the product – e.g. use of a specific documented feature of the product or assistance with a specific problem or error message. While this issue may involve other aspects of the product, addressing other aspects constitutes a separate issue and requires an additional support incident. A single support incident may involve multiple phone calls, emails and off-line research. Barco will determine what characterizes a single support incident and communicating this to you. Unless a contractual agreement states differently, Barco will make reasonable efforts to resolve the issue but Barco cannot guarantee that every issue will be resolved.
- Barco shall not be obliged to provide any Support Services relating to problems or issues arising out of or from (i) the use of the Software in a manner for which they were not designed; (ii) damage to the media on which the Software are provided or to the computer on which the Software are installed; (iii) negligence, misuse, or modification of the Software; (iv) versions of Software other than the most recent version (e.g., 5.x) and one version back (e.g., 4.x), provided that Barco shall also not be required to provide any Support Services for Software that are no longer listed on the Barco Site as supported Software; (v) third-party Software and technologies not associated with network installation assistance or (vi) conflicts related to replacing or installing hardware, drivers, and software.
- You will remain responsible for the maintenance of your hardware, operating system, the functioning of your network and in keeping your systems virus-free. You acknowledge that the Software is a complex computer software application, and that the performance thereof may vary depending hardware platform, software interactions and configuration. You acknowledge that the Software is not designed and produced specifically to meet your specific requirements and expectations and the selection of the Software by you is entirely your own choice and decision.
- The Software has to be installed on a computer delivered by Barco or by yourself. The XDS Racu software is only compatible with Microsoft Windows XP and Microsoft Windows XP Embedded. The XDS Display Wall Software is only compatible with Microsoft Windows XP, Vista or Windows 7.
- For the avoidance of doubt, nothing in this clause shall impose any obligation on Barco to provide Services not covered by the License Agreement.
9. This Software License is the only understanding and agreement between you and Barco for use of the Software by you and/or Authorized Users. The Software License supersedes all other communications, understandings or agreements we had prior to this Software License (with the exception of any continuing confidentiality agreement) although nothing in this Software License purports to exclude liability for fraudulent misrepresentation. You may not export or re-export the Software or any copy or adaptation in violation of any applicable laws or regulations. This Software License shall not be altered, amended or varied. If any provision of this Software License is determined to be illegal, void or unenforceable, or if any court of competent jurisdiction in any final decision so determines, this Software License shall continue in full force save that such provision shall be deemed to be deleted with effect from the date of such decision, or such earlier date.
10. You acknowledge that this Software may be subject to U.S. or other governments Export Jurisdiction. You agree to comply with all applicable international and national laws that apply to the Software, including the U.S. Export Administration Regulations, as well as end-user, end-use, and destination restrictions issued by the U.S. or other governments.
11. Barco shall be entitled to sub-contract all or any of Barco's obligations hereunder to a third party and/or any of Barco's affiliated companies.
12. The construction, validity and performance of this Software License shall be governed in all respects by the laws of Belgium without recourse to its conflict of law principles. All disputes arising in any way out of or affecting this Software License shall be subject to the exclusive jurisdiction of the courts of Kortrijk, without prejudice to enforcement of any judgment or order thereof in any other jurisdiction.
13. The United Nations Convention on Contracts for the International Sale of Goods (the "Convention") shall not apply to this Software License, however, if the Convention is deemed by a court of competent jurisdiction to apply to this Software License, Barco shall not be liable for any claimed non-conformance of the Software under Article 35(2) of the Convention.

Trademarks

Brand and product names mentioned in this manual may be trademarks, registered trademarks or copyrights of their respective holders. All brand and product names mentioned in this manual serve as comments or examples and are not to be understood as advertising for the products or their manufacturers.

Guarantee and Compensation

Barco provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. On receipt, the purchaser must immediately inspect all delivered goods for damage incurred during transport, as well as for material and manufacturing faults Barco must be informed immediately in writing of any complaints.

The period of guarantee begins on the date of transfer of risks, in the case of special systems and software on the date of commissioning, at latest 30 days after the transfer of risks. In the event of justified notice of complaint, Barco can repair the fault or provide a replacement at its own discretion within an appropriate period. If this measure proves to be impossible or unsuccessful, the purchaser can demand a reduction in the purchase price or cancellation of the contract. All other claims, in particular those relating to compensation for direct or indirect damage, and also damage attributed to the operation of software as well as to other services provided by Barco, being a component

of the system or independent service, will be deemed invalid provided the damage is not proven to be attributed to the absence of properties guaranteed in writing or due to the intent or gross negligence or part of Barco.

If the purchaser or a third party carries out modifications or repairs on goods delivered by Barco, or if the goods are handled incorrectly, in particular if the systems are commissioned operated incorrectly or if, after the transfer of risks, the goods are subject to influences not agreed upon in the contract, all guarantee claims of the purchaser will be rendered invalid. Not included in the guarantee coverage are system failures which are attributed to programs or special electronic circuitry provided by the purchaser, e.g. interfaces. Normal wear as well as normal maintenance are not subject to the guarantee provided by Barco either.

The environmental conditions as well as the servicing and maintenance regulations specified in the this manual must be complied with by the customer.

Disposal Information

Waste Electrical and Electronic Equipment



■ This symbol on the product indicates that, under the European Directive 2012/19/EU governing waste from electrical and electronic equipment, this product must not be disposed of with other municipal waste. Please dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

For more information about recycling of this product, please contact your local city office or your municipal waste disposal service. For details, please visit the Barco website at: <http://www.barco.com/en/AboutBarco/weee>

Federal Communications Commission (FCC Statement)

This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference at his own expense

Turkey RoHS compliance



■ Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.

[Republic of Turkey: In conformity with the WEEE Regulation]

中国大陆 RoHS – Chinese Mainland RoHS

根据中国大陆《电子信息产品污染控制管理办法》(也称为中国大陆RoHS), 以下部分列出了Barco产品中可能包含的有毒和/或有害物质的名称和含量。中国大陆RoHS指令包含在中国信息产业部MCV标准:“电子信息产品中有毒物质的限量要求”中。

According to the “China Administration on Control of Pollution Caused by Electronic Information Products” (Also called RoHS of Chinese Mainland), the table below lists the names and contents of toxic and/or hazardous substances that Barco's product may contain. The RoHS of Chinese Mainland is included in the MCV standard of the Ministry of Information Industry of China, in the section “Limit Requirements of toxic substances in Electronic Information Products”.

零件项目(名称)	有毒有害物质或元素					
Component Name	Hazardous Substances or Elements					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印制电路配件 Printed Circuit Assemblies	x	0	x	0	0	0
电(线)缆 Cables	x	0	x	0	0	0

底架	x	0	x	0	0	0
Chassis						
电源供应器	x	0	x	0	0	0
Power Supply Unit						
文件说明书	0	0	0	0	0	0
Paper Manuals						
光盘说明书	0	0	0	0	0	0
CD Manual						
光学部件	x	0	x	0	0	0
Optical components						
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363 2006.</p>						

在中国大陆销售的相应电子信息产品 (EIP) 都必须遵照中国大陆《电子信息产品污染控制标识要求》标准贴上环保使用期限 (EFUP) 标签。Barco 产品所采用的 EFUP 标签 (请参阅实例, 徽标内部的编号使用于制定产品) 基于中国大陆的《电子信息产品环保使用期限通则》标准。

All Electronic Information Products (EIP) that are sold within Chinese Mainland must comply with the "Electronic Information Products Pollution Control Labeling Standard" of Chinese Mainland, marked with the Environmental Friendly Use Period (EFUP) logo. The number inside the EFUP logo that Barco uses (please refer to the photo) is based on the "Standard of Electronic Information Products Environmental Friendly Use Period" of Chinese Mainland.



Image -1

TABLE OF CONTENTS

1. About	5
1.1 Versions	5
1.2 About this manual	5
1.3 Related products	5
1.4 Symbols and fonts	6
2. Safety	7
2.1 Safety labels	7
2.2 Safety and warnings	10
2.2.1 Notice on safety	10
2.2.2 Installation instructions	11
2.2.3 Owner's record	11
2.2.4 Warnings	11
2.2.5 Plug types	11
2.2.6 Prevent personal injury	12
2.2.7 Device damage	12
2.2.8 Environment condition check	12
2.2.9 Repacking	13
2.2.10 Emergency stop	13
2.2.11 Moving parts	13
2.2.12 Class 2 laser	14
2.2.13 SFTP Cat.5e cable warning	14
2.2.14 Vibrations	15
3. Compliancy	17
3.1 EMC shielding clamps	17
4. Packaging	19
4.1 Content	19
4.2 Unpacking	19
4.3 Shipping bracket	22
4.3.1 Removing the shipping bracket	23
4.3.2 Installing the shipping bracket	23
5. Facility and system requirements	25
5.1 Environmental requirements	25
5.2 Dimensions	25
5.3 Air flow requirements	27
5.4 Power requirements	28
5.5 View requirements	28
5.6 Access requirements	28
5.7 Luminance requirements	29
6. Specifications	31
6.1 Hardware layout	31
6.2 Gimbal range	33
6.3 Camera FOV	34
7. Installation	35
7.1 Mechanical installation	35
7.2 Hardware connections	37
7.2.1 Preparing SFTP Cat.5e cable	37
7.2.2 Power connections	38
7.2.3 Connecting the LEX unit to the MCU	39
7.2.4 Connecting the SFTP Cat.5e cable	39
7.2.5 Connection diagram	40
7.3 Driver installation	41
7.4 Uploading the calibration files	41
7.4.1 Uploading the spectrometer calibration file	41
7.4.2 Uploading the camera calibration file	42
7.5 Importing the license file	43
7.6 Camera settings	43
7.6.1 Fixed camera settings	43
7.6.2 Lens cap	44
7.6.3 Zoom	44
7.6.4 Focus	45
7.7 AutoAlignment parameters	46
8. Getting started	49
8.1 Starting up the MCU, eRACU and AutoAlignment Head	49
8.1.1 Starting up the MCU	49
8.1.2 Starting up the eRACU	50
8.1.3 Starting up the AutoAlignment Head	50

8.2	Connecting to a display	51
8.3	Configuring the software	52
8.4	Defining multiple head location	52
8.5	Setting Gimbal Home Position	54
8.6	Defining positions.....	55
8.6.1	Displaying the Positioning Page.....	55
8.6.2	Acuras position.....	56
8.6.2.1	Defining Acuras 1-point position	57
8.6.2.2	Defining Acuras Multi-point	61
8.6.2.2.1	Description of the Acuras Multi-point	61
8.6.2.2.2	Defining the Panel Markers	65
8.6.2.2.3	Defining the Gimbal positions.....	71
8.6.3	AutoGeometry position: Faceted display	76
8.6.3.1	Difference between AutoGeometry faceted and warp display	76
8.6.3.2	Defining AutoGeometry position: standard channels	77
8.6.3.3	Defining AutoGeometry position: Head-Up Display.....	85
8.6.3.4	Creating Mask image.....	89
8.6.4	AutoGeometry position: Warp display.....	90
8.6.4.1	Difference between AutoGeometry faceted and warp display	90
8.6.4.2	Defining the AutoGeometry position	90
8.6.5	OmniBlend position	96
8.6.5.1	OmniBlend position explained	96
8.6.5.2	Defining OmniBlend position.....	98
8.6.5.3	Creating Mask image.....	103
8.7	ECR calibration	104
9.	Dynacolor™ calibration	107
9.1	Dynacolor calibration	107
9.2	Matching Dynacolor sets of multiple projectors	109
9.3	Dynacolor calibration: Color alignment	112
9.4	Undoing a color alignment	113
10.	Operating Acuras.....	115
10.1	Preconditions	116
10.1.1	CLO regression principle	116
10.1.2	Conditions for Acuras Capture and Realign	118
10.2	Gray Level Correction	118
10.2.1	Starting the Gray Level Correction process.....	119
10.2.2	Restoring the Gray Level Correction	120
10.2.3	Undoing the Gray Level Correction	121
10.3	Acuras Capture	121
10.4	Acuras Realignment	124
10.5	Undoing an Acuras realignment	128
10.6	Restoring the white uniformity factory settings	129
10.7	Deleting Acuras realignment data.....	131
11.	Operating AutoGeometry: Faceted display	133
11.1	AutoGeometry Capture.....	133
12.	Operating AutoGeometry: Warp display	137
12.1	AutoGeometry Capture.....	137
12.2	AutoGeometry Realignment.....	139
12.3	Deleting Warp Realignment data	141
13.	Operating OmniBlend	145
13.1	The OmniBlend process.....	145
13.2	Displaying the OmniBlend page	145
13.3	Starting OmniBlend process: projector basis.....	146
13.4	Starting OmniBlend process: position basis.....	147
13.5	Undoing an OmniBlend process	148
14.	Replacing devices.....	151
14.1	Replacing a camera	151
14.2	Replacing a spectrometer	152
14.3	Replacing a laser	152
15.	Troubleshooting	155
15.1	Empty display list	155
15.2	AutoAlignment Head	156
15.3	LEX Unit	156
15.4	Camera	157
15.5	Laser pointer.....	159
15.6	Spectrometer	160
15.7	Gimbal	162
15.8	USB device not detected	163

A. CE declaration.....	165
A.1 CE declaration.....	165
Index.....	167
List of images.....	171

1. ABOUT



For the latest updates of this manual, browse to www.barco.com (public) or <https://my.barco.com> (secured) or Intranet (Barco employees only).

1.1 Versions

Versions

By the time of release of this manual, two different versions of AutoAlignment Head are available: AutoAlignment Head Gen II (R9843500) and AutoAlignment Head Gen II Rugged (R9843501).

AutoAlignment Head Gen II is also referred to as AutoAlignment Head and MES ACURAS HEAD



CAUTION: Due to a supplier component change, the AutoAlignment Head Gen II Rugged (R9843501) uses a new rugged gimbal from serial number 1199151060 onwards. The new gimbal is automatically detected from XDS version V3.11 onwards. For existing installations (XDS below V3.11), a patch will be made available through Barco support or an upgrade to XDS version 3.11 will be advised where needed.

1.2 About this manual

About this manual

Partnumber	Description	Level
R59770509	User and installation guide	Installer and user



Always check for the latest version of the manual on <https://my.barco.com>.

Graphics and contents

Depending on the XDS RACU software version, some graphics might be slightly different to the ones used in this manual. This however does not have any effect to the functionality.

Depending on the AutoAlignment Head version, some graphics might be slightly different for the given version to the ones used in this manual. This however, does not have any effect on their functionality.

The differences between both AutoAlignment Head versions (standard and rugged) are illustrated through graphics and/or content. If no version is specified in a procedure, it applies to both standard version and rugged version. If a procedure applies to one version only, it is explicitly stated.

1.3 Related products

Software related products

The main tools are the following:

Description	Installed on the ...
XDS RACU server software	MCU
XDS RACU client software	eRACU hand held unit

Hardware related products






Description	Used as/for ...
MCU	server

Description	Used as/for ...
eRACU hand held unit	Remote control touch screen panel
AutoAlignment Head	Automatic measurements and alignment
Barco Rugged	Automatic measurements and alignment

1.4 Symbols and fonts

Symbol overview

The following icons are used in the manual :

	Caution
	Warning
	Info, term definition. General info about the term
	Note: gives extra information about the described subject
	Tip: gives extra advice about the described subject

Font overview

- Buttons are indicated in bold, e.g. **OK**.
- Menu items are indicated in *italic*.
- Step related notes, tips, warnings or cautions are printed in *italic*.
- Procedure related notes, tips, warnings or cautions are printed in **bold** between 2 lines preceded by the corresponding icon.

2. SAFETY





Overview

- Safety labels
- Safety and warnings


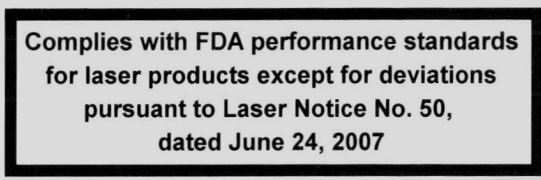

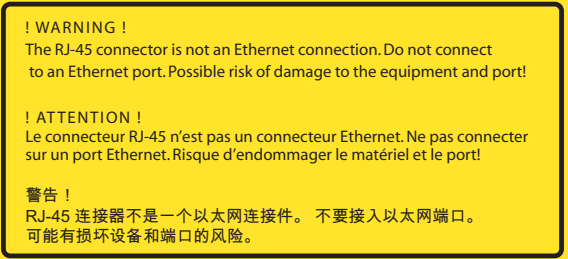
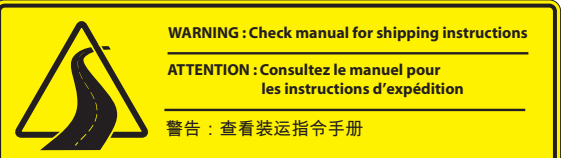
2.1 Safety labels

Overview of the safety labels

The table below lists all of the safety related labels that are available on the MES ACURAS HEAD (standard and rugged) versions. Carefully read these labels and act accordingly.

Label	Description
	Refer to the manual for more detailed information.
	Fingers can be clamped between moving parts. (Only available on standard version).
	Class 2 laser radiation: do not stare into the beam.
	Position of the laser aperture.

2. Safety

Label	Description
	<p>Moving parts: keep fingers, other body parts, loose clothes, jewelry, rings etc. away.</p>
	<p>FDA compliancy</p>
	<p>Emergency stop: engage in case of a dangerous situation. Do not reset before the situation is fully safe again.</p>
	<p>This RJ45 connector is not a network connector. One of the pins is a power signal.</p>
	<p>Check manual for shipping instruction. (Only available on rugged version).</p>

Position of the safety labels (on standard version)

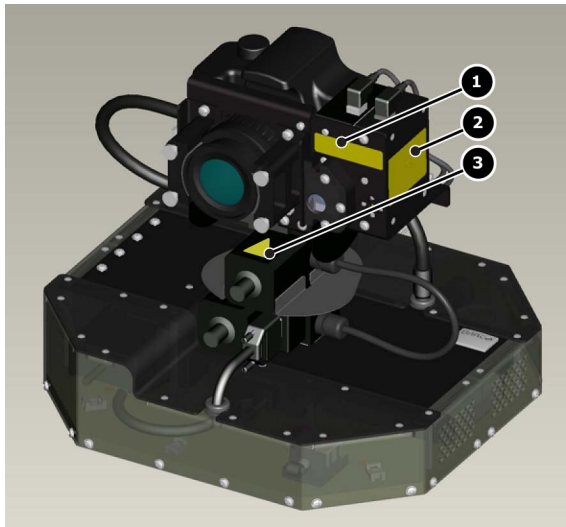


Image 2-1
Labels: position

- 1 Laser aperture
- 2 Laser radiation
- 3 Clamped fingers

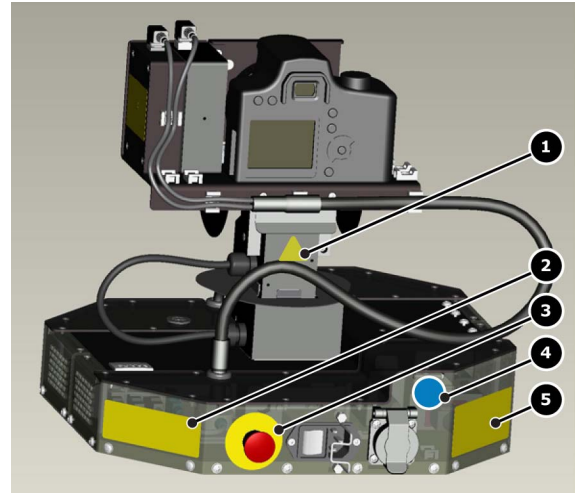


Image 2-2
Labels: position

- 1 Clamped fingers
- 2 Moving parts
- 3 Emergency stop
- 4 Refer to manual for information
- 5 RJ45 connector is not an Ethernet connection

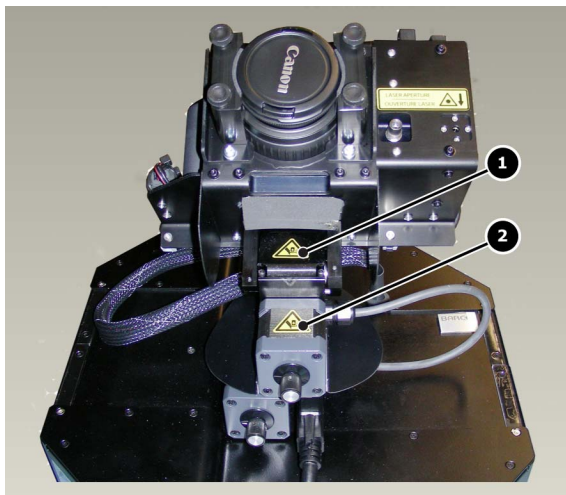


Image 2-3
Labels: position

- 1 Clamped fingers

2. Safety

2 Clamped fingers

Position of the safety labels (on rugged version)

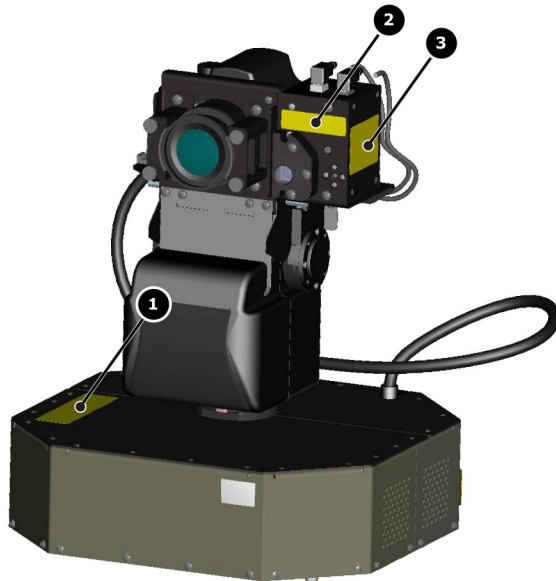


Image 2-4
Labels: position

- 1 Check manual for shipping instruction
- 2 Laser aperture
- 3 Laser radiation

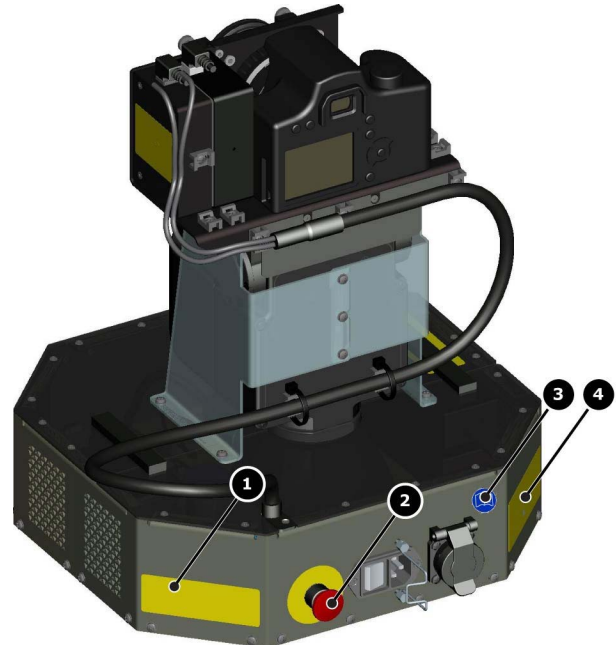


Image 2-5
Labels: position

- 1 Moving parts
- 2 Emergency stop
- 3 Refer to manual for information
- 4 RJ45 connector is not an Ethernet connection

2.2 Safety and warnings

About this chapter

It is necessary to read this chapter prior to starting any activity on the device. It contains valuable and critical information to ensure safety of the operator, the service technician or other people in the neighborhood of the device.

Overview

- Notice on safety
- Installation instructions
- Owner's record
- Warnings
- Plug types
- Prevent personal injury
- Device damage
- Environment condition check
- Repacking
- Emergency stop
- Moving parts
- Class 2 laser
- SFTP Cat.5e cable warning
- Vibrations

2.2.1 Notice on safety

Notice on Safety

This equipment is built in accordance with the requirements of the international safety standards IEC60950-1, EN60950-1, UL60950-1 and CAN/CSA - C22.2 No.60950-1, which are the safety standards of information technology equipment including electrical business equipment. These safety standards impose important requirements on the use of safety critical components,

materials and isolation, in order to protect the user or operator against risk of electric shock and energy hazard, and having access to live parts. Safety standards also impose limits to the internal and external temperature rises, radiation levels, mechanical stability and strength, enclosure construction and protection against the risk of fire. Simulated single fault condition testing ensures the safety of the equipment to the user even when the equipment's normal operation fails.

2.2.2 Installation instructions

Installation Instructions

- Before operating this equipment please read this manual thoroughly, and retain it for future reference.
- Installation and preliminary adjustments can be performed after reading the documentation manuals in detail.
- All warnings on the device and in the documentation manuals should be adhered to.
- All instructions for operating and use of this equipment must be followed precisely.

2.2.3 Owner's record

Owner's Record

The part number and serial number can be found on the label at the back side of the device. Record these numbers in the table below. Refer to them whenever you call your Barco dealer regarding this product.

Part Number:	
Serial Number:	
Dealer:	

2.2.4 Warnings

Safety warnings

- To prevent fire or electrical shock hazard, do not expose this equipment to rain or moisture!
- This product should be operated from an AC power source. Power input is auto-ranging from 100 V to 240 V.
- All equipment in the system is equipped with a 3-wire grounding plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
- Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- If an extension cord is used with this product, make sure that the total of the Ampere ratings on the products plugged into the extension cord does not exceed the extension cord Ampere rating.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electrical shock.
- Never spill liquid of any kind on the product. Should any liquid or solid object fall into the cabinet, unplug the set and have it checked by qualified service personnel before resuming operations.
- Lightning - For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet. This will prevent damage to the device due to lightning and AC power-line surges.

2.2.5 Plug types



WARNING: The AC mains power adapter must be grounded (earthed) via the supplied 3 conductor AC power cable. If the supplied power cable is not the correct one, consult your dealer.

Plug types

a. Mains lead (AC Power cord) with CEE 7 plug up to 16 A

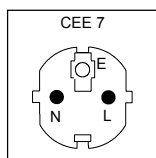


Image 2-6

The colors of the mains lead are colored in accordance with the following code:

2. Safety

Green + yellow: Earth (Ground)

Blue: Neutral

Brown: Line (Live)

b. Power cord with NEMA 5/15 plug up to 15 A

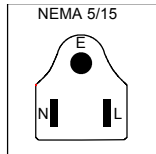


Image 2-7

The wires of the power cord are colored in accordance with the following code.

Green or yellow + green: Earth (Ground)

Blue or white: Neutral

Brown or black: Line (Live)

2.2.6 Prevent personal injury

To prevent personal injury

To prevent injuries and physical damage, always read this manual and all labels on the system before connecting to the wall outlet.

To prevent injuries, take note of the weight of the device.

Before attempting to remove any of the device's covers, you must turn off the device and disconnect from the wall outlet.

2.2.7 Device damage

To prevent device damage

In order to ensure that correct airflow is maintained, and that the device complies with Electro-Magnetic Compatibility requirements, it should always be operated with all of its covers in place.

Ensure that nothing can be spilled on, or dropped inside the device. If this does happen, switch off and unplug the mains supply immediately. Do not operate the device again until it has been checked by qualified service personnel.

The device must always be mounted in a manner which ensures free flow of air into its air inlets and unimpeded evacuation of the hot air exhausted from its cooling system. Heat sensitive materials should not be placed in the path of the exhausted air.

2.2.8 Environment condition check

Environment condition check

A device must always be mounted in a manner which ensures the free flow of clean air into the device's ventilation inlets. For installations in environments where the device is subject to excessive dust, then it is highly advisable and desirable to have this dust removed prior to it reaching the device clean air supply. Devices or structures to extract or shield excessive dust well away from the device are a prerequisite; if this is not a feasible solution then measures to relocate the device to a clean air environment should be considered.

It is the clients responsibility to ensure at all times that the device is protected from the harmful effects of hostile airborne particles in the environment of the device. The manufacturer reserves the right to refuse repair if a device has been subject to negligence, abandon or improper use.

Ambient temperature conditions

Max. ambient temperature : +40°C or 104°F

Min. ambient temperature: 0°C or 32°F

Storage temperature: -20°C to +60°C (-4°F to 140°F)

Humidity Conditions

Storage: 0 to 98% relative humidity, non-condensing

Operation: 0 to 85% relative humidity, non-condensing

Environment

Do not install the device in a site near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or humidity. Be aware that room heat rises to the ceiling; check that temperature near the installation site is not excessive.

Environment condition check

The device must always be mounted in a manner which ensures the free flow of clean air into the air intake and out of the air outlet.

2.2.9 Repacking

On Repacking

Save the original shipping carton and packing material; they will come in handy if you ever have to ship your equipment. For maximum protection, repack your set as it was originally packed at the factory.

2.2.10 Emergency stop

Emergency stop

The emergency stop button is the large, circular red switch located at the rear side of the device. Pressing the emergency stop button will disconnect the main power going to the modules of the MES ACURAS HEAD (RUGGED). To release it, turn the button in the direction of the arrow. It should only be re-enabled if the situation is fully safe.

Use the emergency stop button only in emergencies.



Image 2-8
Emergency button + label

2.2.11 Moving parts



WARNING: Make sure that nobody and nothing is present within an area of 1 meter around the AutoAlignment Head during operation.

Moving parts

- Keep your hands and fingers away from all moving parts.
- Do not wear loose clothing or jewelry. Keep long hair, clothing, scarves, rings, bracelets, gloves and such away from moving parts, since they can be caught in moving parts.
- No people are allowed to come near the unit when it is in operation
- Do not operate the unit when other people can come near to the unit.
- Keep children, outsiders, and other untrained persons away from the unit and its moving parts.
- Ensure that there is no loose cabling from the unit that can get caught by the moving parts.

Immediately stop operation if Gimbal Pan/Tilt does not respond to control

- Test Gimbal Pan/Tilt movement when initially operating the unit.
- Ensure Pan movement is going full -180° and $+180^\circ$.
- Ensure Tilt movement is going full -80° and $+30^\circ$.
- Ensure all controls function smoothly and do not stick or bind when operated.
- Avoid any type of manual intervention when operating the unit.



Image 2-9
Moving parts warning label



Image 2-10
Moving parts warning label

2.2.12 Class 2 laser

Class 2 laser

- The laser device installed on the MES ACURAS HEAD (RUGGED) is classified as a Class 2 laser. Class 2 laser is not considered as an optically dangerous device as the eye reflex will prevent any ocular damage.
- Switch OFF the laser device when not in use.
- Never look into the laser beams directly.
- Avoid direct eye exposure.
- Never operate the unit if other people are in the same room.
- No bystanders are allowed near to or inside the room when the laser device is in operation.
- Never come near to unit during operation.
- Never aim the laser beams to a projector lens. Direct or indirect hitting of a laser beam on to the lens can severely damage to the optical engines in which case there is a loss of warranty

Following labels can be found on the unit:



Image 2-11
Laser warning label



Image 2-12
Laser warning label

FDA compliancy

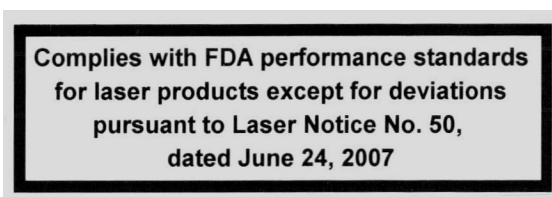


Image 2-13

2.2.13 SFTP Cat.5e cable warning

SFTP Cat.5e cable warning

The supplied SFTP Cat.5e cable is a RJ45 cable. It is used for communication between the MES ACURAS HEAD and the MCU via LEX unit. The total length of the SFTP Cat.5e cable is 50 meter.

Never connect the SFTP Cat.5e cable to an Ethernet card, hub, switch or port or other Ethernet RJ45 connector of an Ethernet device or MCU. Damage to devices connected to the Ethernet may result.

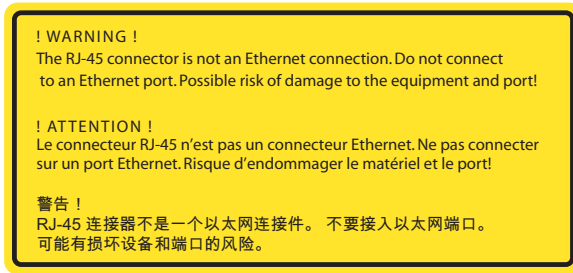


Image 2-14
SFTP Cat.5e cable warning label

2.2.14 Vibrations

Vibrations

The standard version of the AutoAlignment Head, being MES ACURAS HEAD (R9843500) is not motion base compatible. It is only to be installed on still or non-moving structures.

The rugged version of the AutoAlignment Head, being MES ACURAS HEAD RUGGED (R9843501) is motion base compatible, which means it can be installed on motion based simulators or on moving structures

3. COMPLIANCE

Introduction

To meet EMC compliance, it is required to take some precaution. See topic below.

Overview

- EMC shielding clamps

3.1 EMC shielding clamps

EMC shielding clamps

When replacing some of the cables, always put back the EMC shielding clamps (Ferrites) in their original position if they were present before.



Image 3-1
EMC shielding clamp

Depending on the type of EMC shielding clamp, use a pair of cutting pliers and/or a slotted screwdriver to open the clamp.



Some cables must make a loop through the EC shielding clamps!

4. PACKAGING

Overview

- Content
- Unpacking
- Shipping bracket

4.1 Content

Content

Description	Article number	Quantity
AutoAlignment Head (standard/rugged)	R765840/R7658402	1
Power cord (connectors C13 and CEE7)	R326103	1
Power cord (connectors C13 and NEMA 5–15)	V326111	1
Power cord (connector C13 and PCR-3)	Z3487503	1
S/FTP CAT5e control cable (connectors RJ45)	CBL-3380–61	1 (length 50m)
USB extender or LEX unit (Icron LEX)	-	1
Ferrite split core	B195382	2
Adhesive label: WARNING No Ethernet connection	R870792	2
AutoAlignment Head Quick install guide	R59770598	1
AutoAlignment Head Service manual	R59770510	1
AutoAlignment Head User and installation manual	R59770509	1
CD-ROM (Calibration files for Spectrometer)	-	1

4.2 Unpacking



CAUTION: Hold the unit at the bottom box to lift and move it. Never hold the camera or Gimbal to lift the AutoAlignment Head.

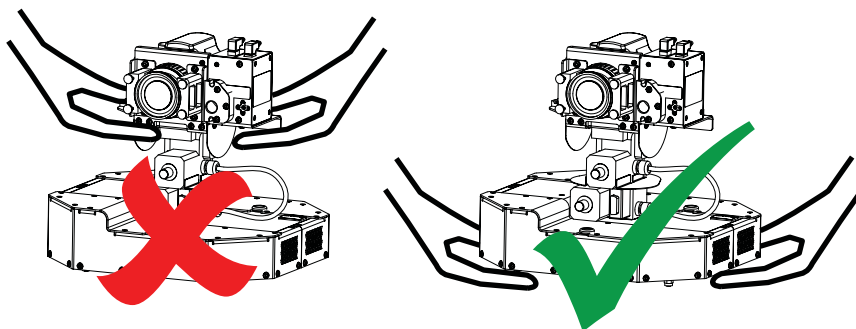


Image 4-1
Lifting instructions: Barco (standard and rugged) version

Packaging

Cardboard boxes and foam are used to protect the device during shipping.



Save the original packaging for future shipment. For maximum protection while shipping the unit, always pack it as it was packed during first delivery.

How to unpack the AutoAlignment Head?

1. Carefully cut the tape on the top lid of the box.
Warning: *Follow the relevant safety precautions while using a knife.*
2. Open the main box and carefully lift out the foam parts, cardboard box and AutoAlignment Head as one unit

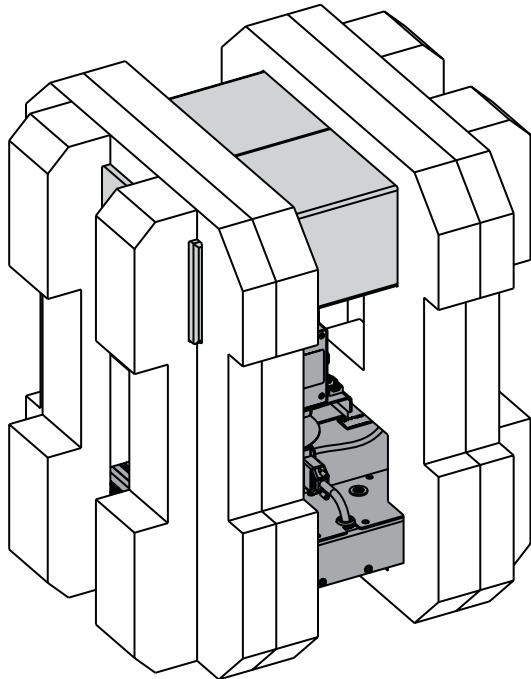


Image 4-2
Packaging: content of the main box

3. Remove the left and right foam part to release the AutoAlignment Head and a second cardboard box.

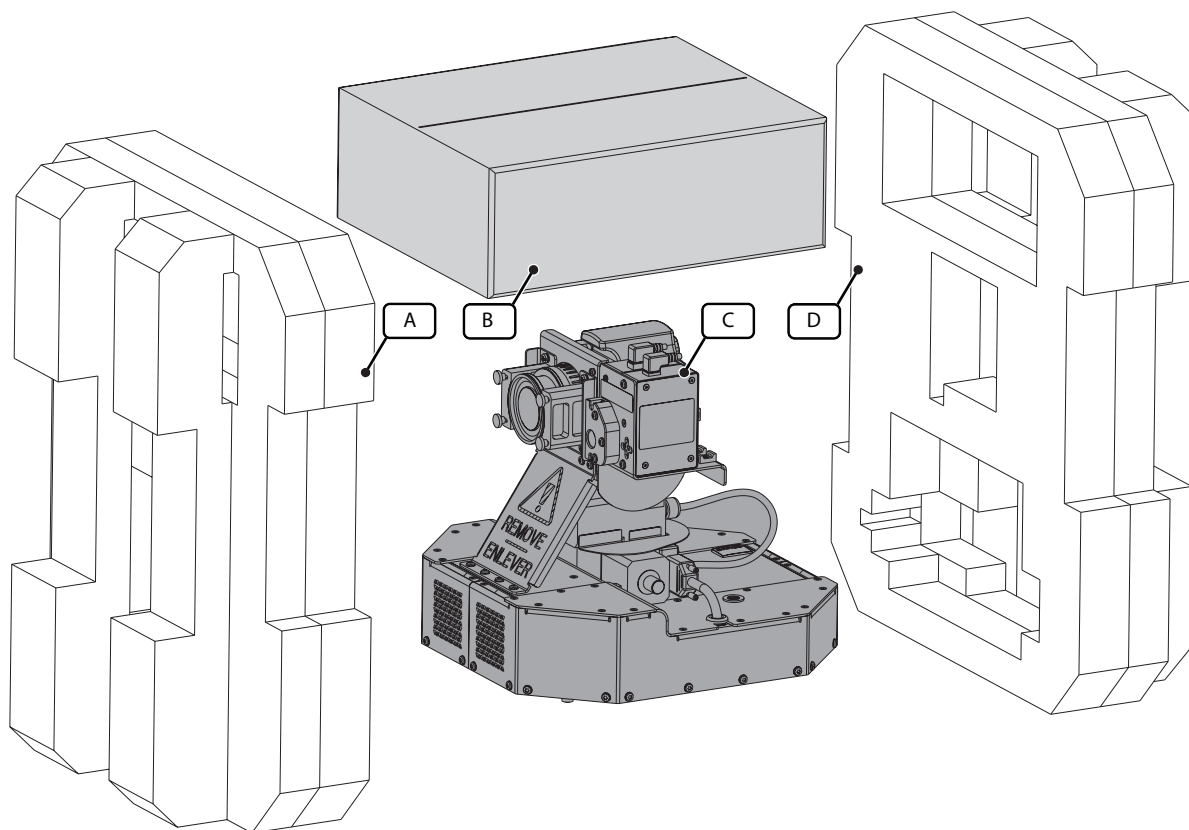


Image 4-3
Packaging: remove the foam parts (AutoAlignment Head standard version)

- A Foam protection part
- B Second cardboard box
- C AutoAlignment Head

4. Packaging

D Foam protection part

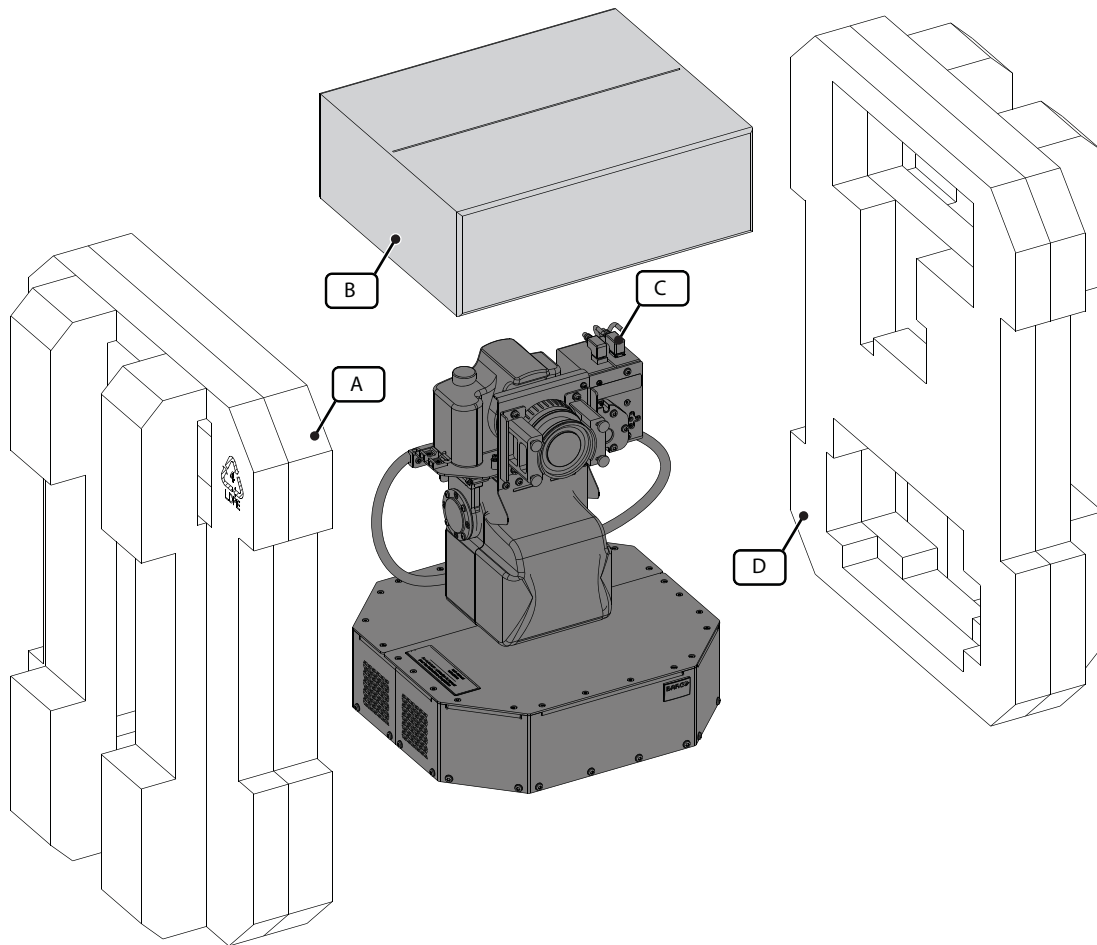


Image 4-4
Packaging: remove the foam parts (AutoAlignment Head rugged version)

- A Foam protection part
- B Second cardboard box
- C AutoAlignment Head
- D Foam protection part

4. Carefully cut the tape on the top lid of the second cardboard box
Warning: Follow the relevant safety precautions while using a knife.
5. Remove the parts from this box.
6. Check if all parts are available. See "Content", page 19.

4.3 Shipping bracket

Introduction

When the AutoAlignment Head is shipped, the **shipping bracket** must be fixed to it. This bracket prevents the Gimbal unit from being damaged due to handling actions during shipment. The shipping bracket must be removed prior to installing the unit.



If this AutoAlignment Head must be shipped ever again, it is necessary to first install the shipping bracket.

Overview

- Removing the shipping bracket
- Installing the shipping bracket

4.3.1 Removing the shipping bracket

Necessary tools

Torx screwdriver T10

How to remove the shipping bracket?

1. Remove all screws fixing the shipping bracket to the AutoAlignment Head.

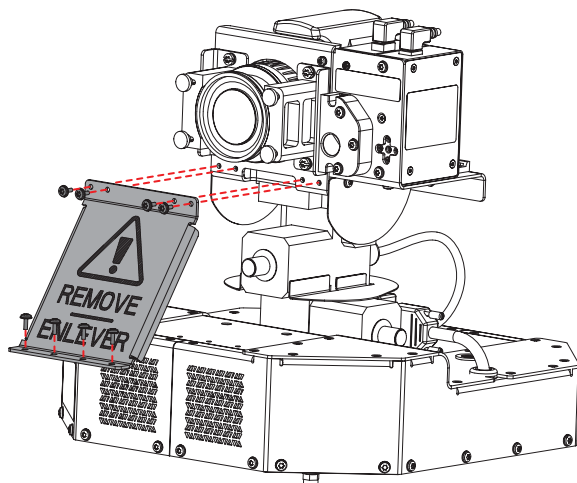


Image 4-5
Shipping bracket removal: standard version

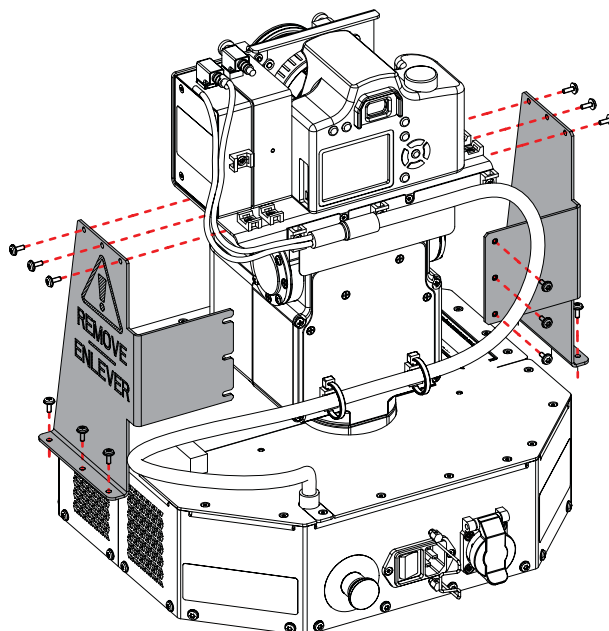


Image 4-6
Shipping bracket removal: rugged version

2. Remove the shipping bracket.
3. Insert all screws in the AutoAlignment Head again and tighten them.

4.3.2 Installing the shipping bracket



CAUTION: The shipping bracket must always be installed on the AutoAlignment Head prior to shipping it!

Necessary tools

Torx screwdriver T10

How to install the shipping bracket?

1. Adjust pan and tilt to align the holes on the AutoAlignment Head exactly to the holes on the shipping bracket. This corresponds to pan 90° / tilt 0° for the standard version and pan 0° / tilt 0° for the rugged version.

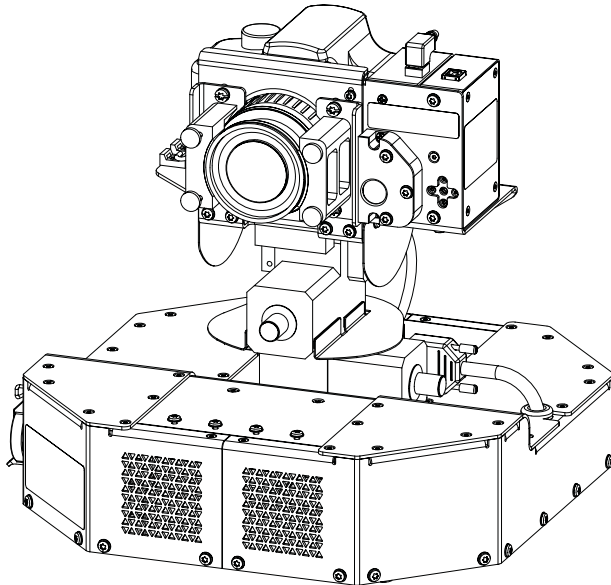


Image 4-7
Orientation to fix shipping bracket: standard version

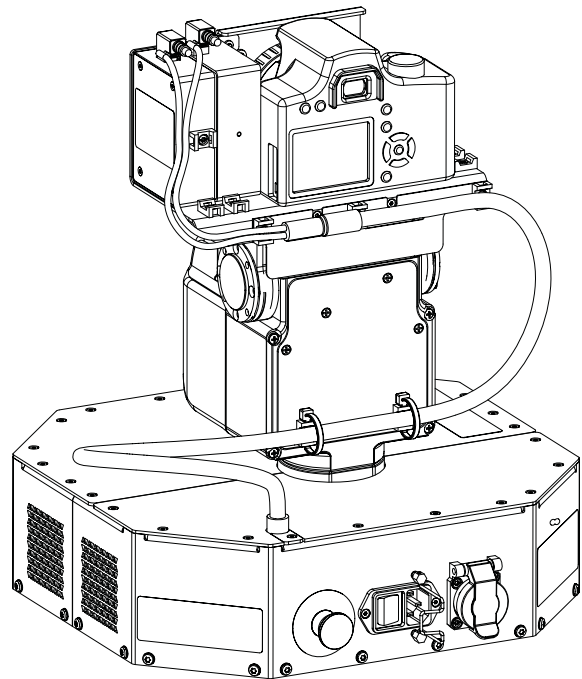


Image 4-8
Orientation to fix shipping bracket: rugged version

Tip: On the standard version, this positioning can be done manually (Pan knob and Tilt knob) or through the XDS RACU user interface.

2. Power off the system and remove the power cord.
3. Disconnect the AutoAlignment Head.
4. Remove the AutoAlignment Head from its support.
5. Fix the shipping bracket to the unit.

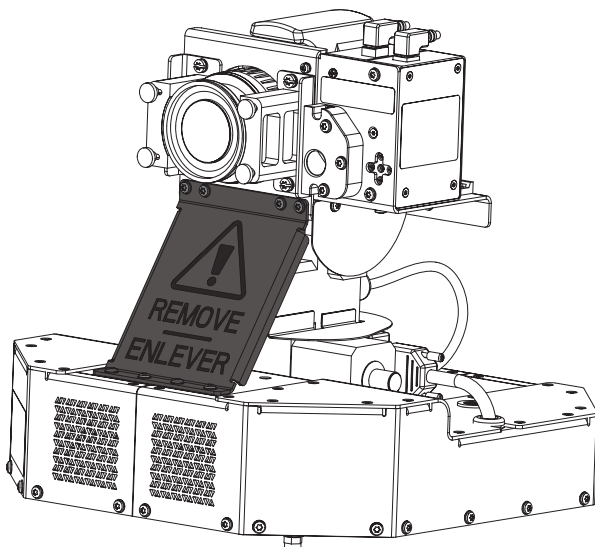


Image 4-9
Shipping bracket: standard version

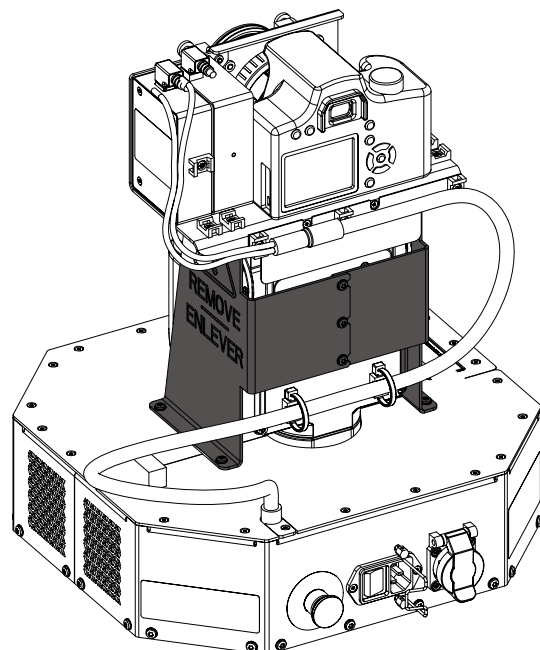


Image 4-10
Shipping bracket: rugged version

Tip: To install the shipping bracket, follow the removal procedure in reverse order.

5. FACILITY AND SYSTEM REQUIREMENTS

About this chapter

This chapter provides information about the installation requirements such as temperature, humidity, dimensions, power net, safety area around the device. Also the air intake and air outlet area of the device are considered.

Overview

- Environmental requirements
- Dimensions
- Air flow requirements
- Power requirements
- View requirements
- Access requirements
- Luminance requirements

5.1 Environmental requirements

Ambient temperature conditions

Storage:

- -20°C to +60°C (-4°F to 140°F)

Operation:

- Max. ambient temperature : +40°C or 104°F
- Min. ambient temperature : 0°C or 32°F

Humidity Conditions

Storage: 0 to 98% relative humidity, non-condensing

Operation: 0 to 85% relative humidity, non-condensing

Environment

Do not install the device in a site near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or humidity. Be aware that room heat rises to the ceiling; check that temperature near the device is not excessive.

Environment condition check

The device must always be mounted in a manner which ensures the free flow of clean air into the air intake and out of the air outlet.

Environmental light conditions

During operation of the AutoAlignment Head , the environment should be fully dark to guarantee correct measurements. Even the light of a small standby LED which is visible on the screen may lead to bad measurement results.

Next to that, there should be no light (not even stray light) pointing to the ocular while the diaphragm of the camera is open. A light beam entering the ocular while the camera's diaphragm is open may lead to damage to the camera.

5.2 Dimensions

Dimensions

The total weight of the AutoAlignment Head standard version is 8.26 kg. The weight of the AutoAlignment Head Rugged version is 11.5 kg.

Dimensions of both versions can be found in the drawings below.

5. Facility and system requirements

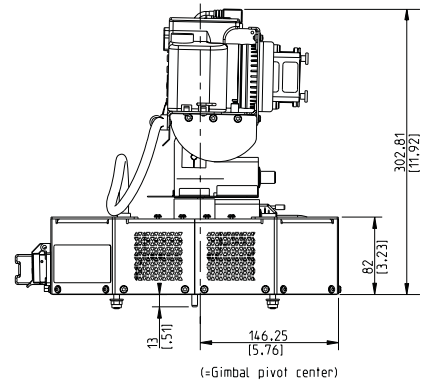
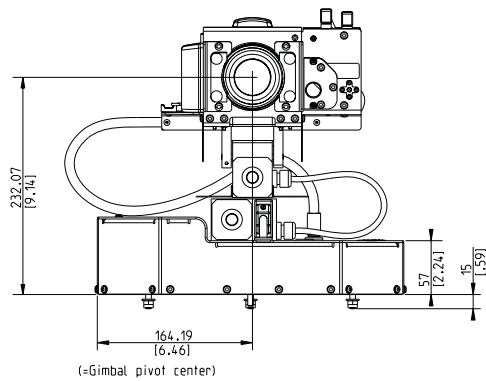
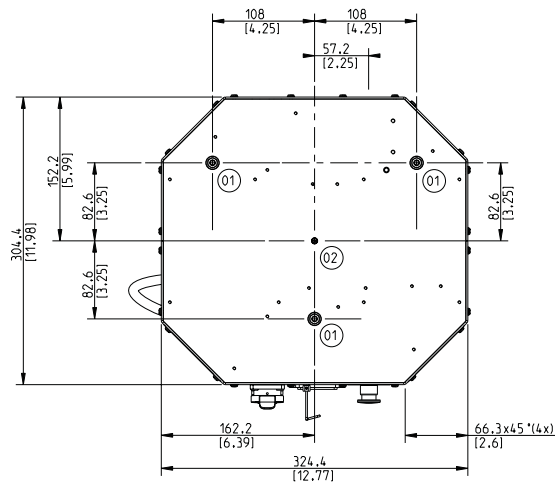


Image 5-1
Dimension: AutoAlignment Head (standard version)

1 M6 Mounting stud

2 Location pin Ø 6mm

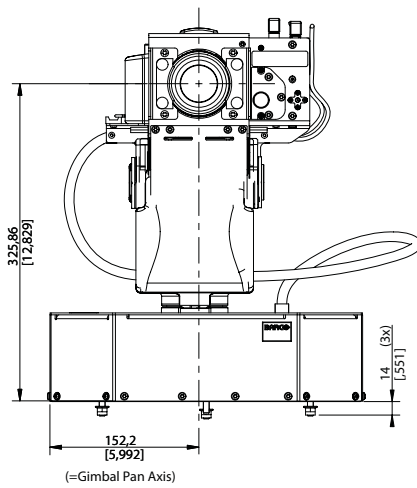
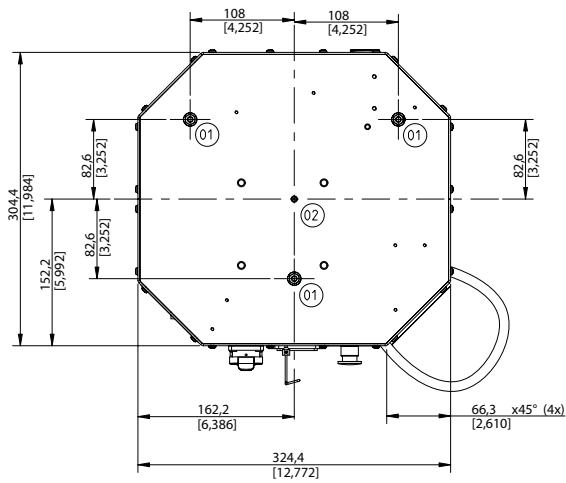
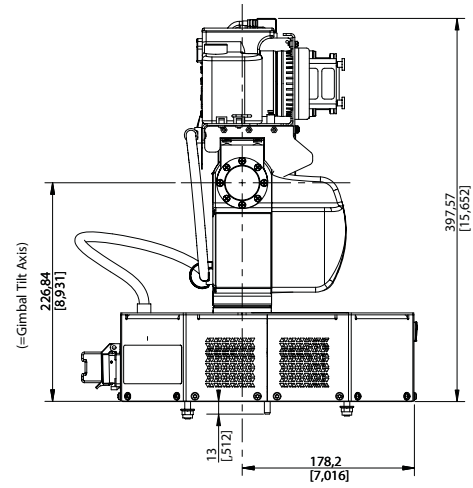


Image 5-2
Dimension: AutoAlignment Head (rugged version)

- 1 M6 Mounting stud
- 2 Location pin Ø 6mm



5.3 Air flow requirements

Air flow requirements

It is important to keep the air grids unblocked. A free area of at least 30 cm should be available around the air grids.

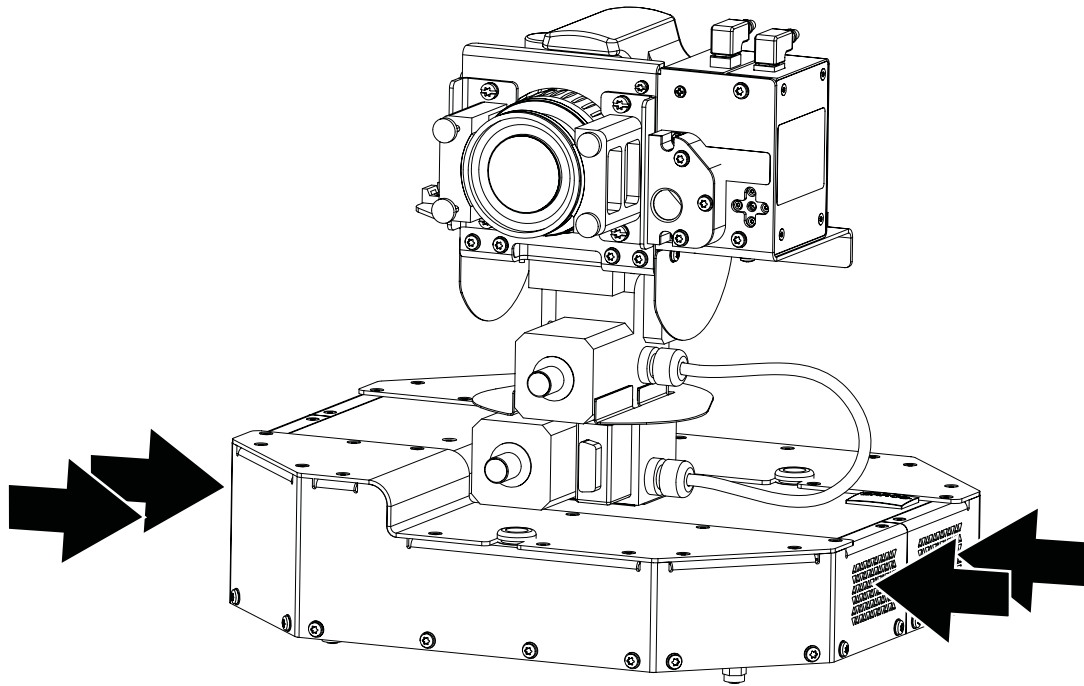


Image 5-3
AutoAlignment Head : position of air grids

5.4 Power requirements

Mains power

Mains power must be in the range 100–250V, 50–60Hz.

Power consumption

The total power consumption of the AutoAlignment Head is 25 Watt at 230 Volt.

5.5 View requirements



Design Eye Point

The Design Eye Point is the position from which the user is intended to view the total image for an optimal view of it.

Camera position

The best position for the AutoAlignment Head is that position where its camera is in the Design Eye Point.

Camera/Spectrometer field of view

Adequate space must be provided around the AutoAlignment Head. No physical or mechanical obstruction should be present in the camera or spectrometer field of view.

5.6 Access requirements

AutoAlignment Head location and access

There must be enough space around the AutoAlignment Head to allow access to and flawless operation of the unit.

Following rules must be taken into account:

- a minimum safety distance of **1 meter** must be considered when the AutoAlignment Head is in operation i.e. no operator and/or bystanders are allowed within the minimum safety distance during operation.
- never try to stop the moving parts manually, it may damage the motor of the AutoAlignment Head.
- do not wear loose clothing or jewelry. Keep long hair, clothing, scarves, rings, bracelets, gloves and such away from moving parts, since they can be caught in moving parts.
- never cover the AutoAlignment Head (e.g. with a tissue) when it is powered on or just after it was powered off.
- no mechanical obstruction for the full AutoAlignment Head movement range.

5.7 Luminance requirements

Ambient light

Followings rules must be taken into account:

- stray light and reflections of it should be avoided, e.g. by using dark wall, ceiling and floor color.
- switch off all external light sources during measurements.
- only aimed spotlight should be used to illuminate small areas if required. Make sure that this aimed spotlight does not fall on the screen during measurements.

6. SPECIFICATIONS

Overview

- Hardware layout
- Gimbal range
- Camera FOV

6.1 Hardware layout

Hardware layout: front view

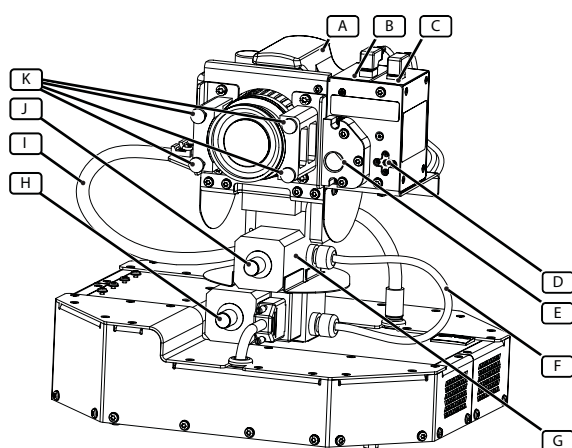


Image 6-1
AutoAlignment Head (standard version) : parts overview

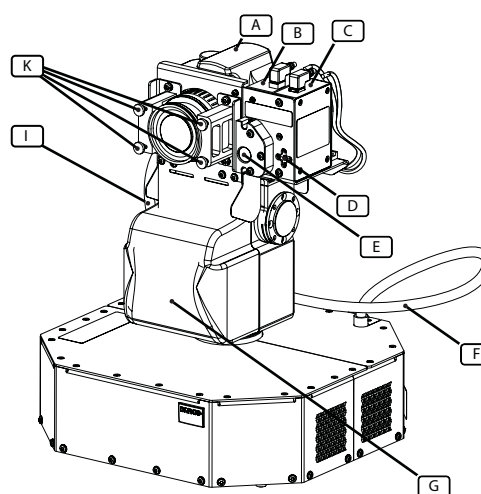


Image 6-2
AutoAlignment Head (rugged version) : parts overview

Label in the image	Description (standard version)	Description (rugged version)
A	Camera	Camera
B	Spectrometer	Spectrometer
C	Laser pointer	Laser pointer
D	Laser aperture	Laser aperture
E	Optical filter	Optical filter
F	Gimbal cable	PAN-TILT unit cable
G	Gimbal	Gimbal (PAN-TILT unit)
H	Manual pan knob (See note)	not available
I	Camera cable	Camera cable
J	Manual tilt knob (See note)	not available
K	Thumb screws to fix the focus ring	Thumb screws to fix the focus ring



Manual pan and tilt adjustment by using the knobs is only allowed when the AutoAlignment Head is not electrically powered. When the device is powered up, the manual pan and tilt knobs are blocked electronically. Forcing a pan or tilt movement via the knobs might damage the device.

Hardware layout: top view

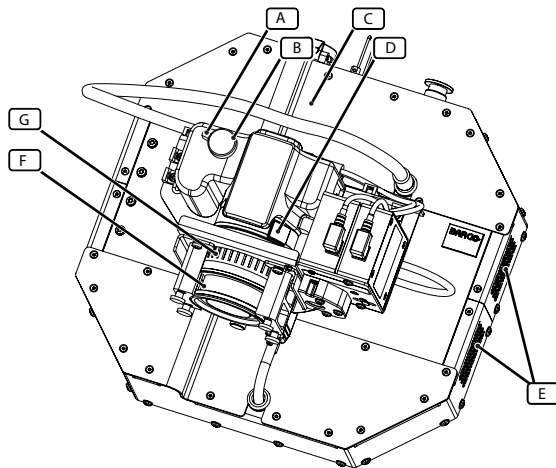


Image 6-3
AutoAlignment Head (standard version) : parts overview

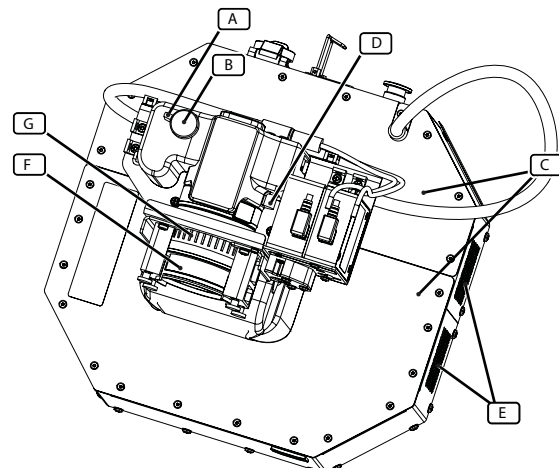


Image 6-4
AutoAlignment Head (rugged version) : parts overview

Label in the image	Description (standard version)	Description (rugged version)
A	Camera: Power On / Off	Camera: Power On / Off
B	Camera: Rotary dial	Camera: Rotary dial
C	Base frame	Base frames
D	Camera lens: Manual / Auto focus	Camera lens: Manual / Auto focus
E	Air grid	Air grid
F	Camera: focus ring	Camera: focus ring
G	Camera: zoom ring	Camera: zoom ring

Hardware layout: rear bottom view

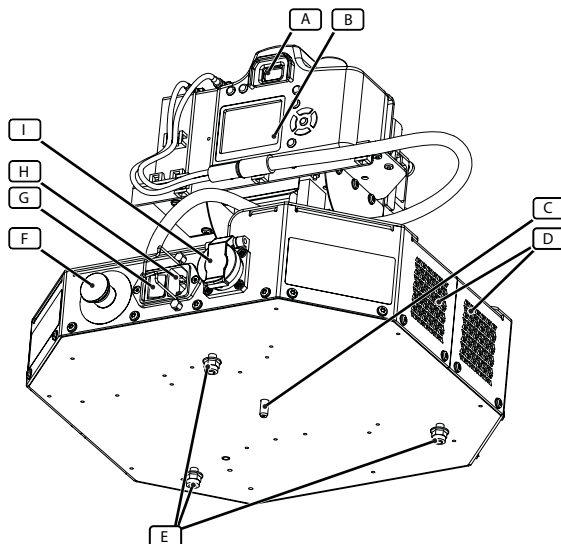


Image 6-5
AutoAlignment Head (standard version) : parts overview

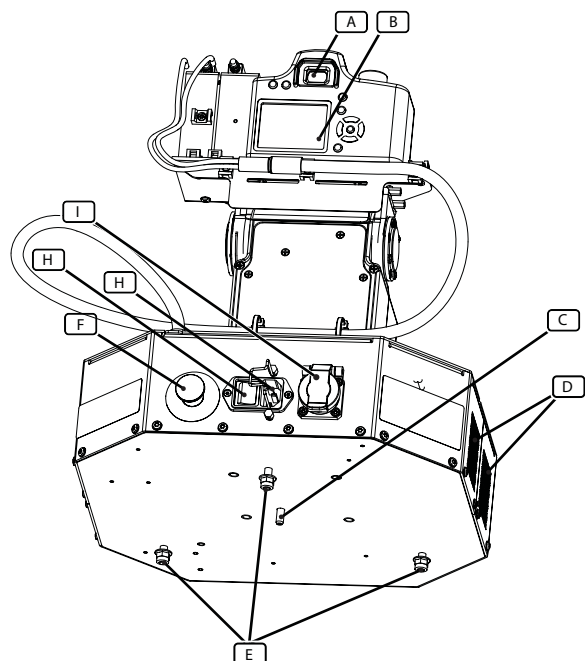


Image 6-6
AutoAlignment Head (rugged version) : parts overview

Label in the image	Description (standard version)	Description (rugged version)
A	Camera: Ocular	Camera: Ocular
B	Camera: LCD display	Camera: LCD display

Label in the image	Description (standard version)	Description (rugged version)
C	Location pin Ø 6mm	Location pin Ø 6mm
D	Air grid	Air grid
E	M6 Mounting studs (and washers + nuts)	M6 Mounting studs (and washers + nuts)
F	Emergency stop	Emergency stop
G	Mains power switch	Mains power switch
H	Mains power connector	Mains power connector
I	SFTP CAT5e connector (covered by a lid)	SFTP CAT5e connector (covered by a lid)

6.2 Gimbal range

Gimbal range

The Gimbal has two degrees of freedom (DOF): **pan** and **tilt**. Pan is the left/right rotation if the AutoAlignment Head is in table position. Tilt is the up / down tilting if in table position.

. The limits are indicated below:

- PAN: range is between -180° and $+180^{\circ}$ for both AutoAlignment Head versions;

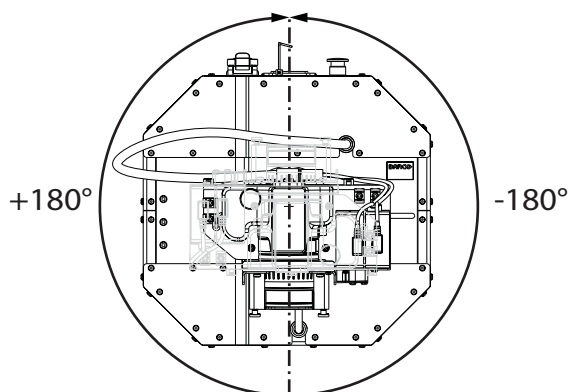


Image 6-7
AutoAlignment Head (standard version) : Pan range

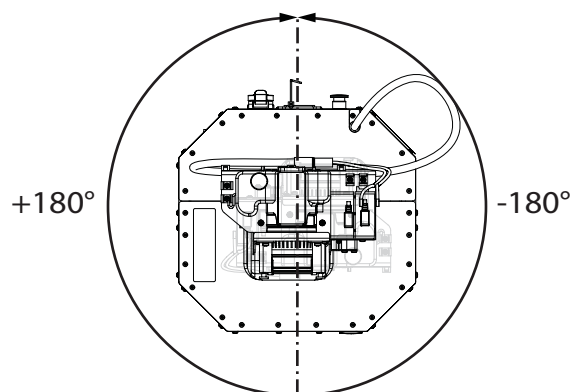


Image 6-8
AutoAlignment Head (rugged version) : Pan range

6. Specifications

- TILT range is between $+30^\circ$ and -80° for standard version and $+30^\circ$ and -90° for rugged version.

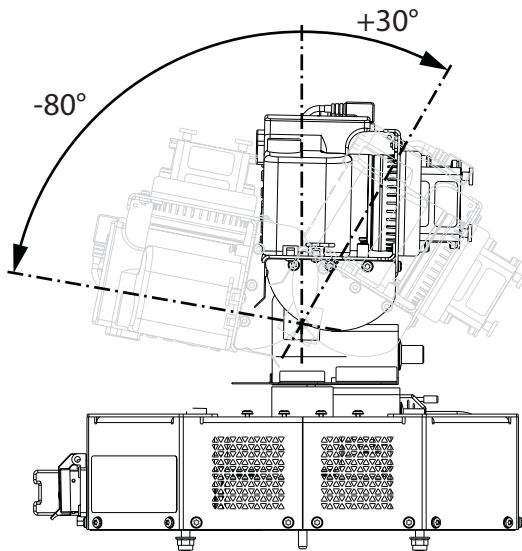


Image 6-9
AutoAlignment Head (standard version) : Tilt range

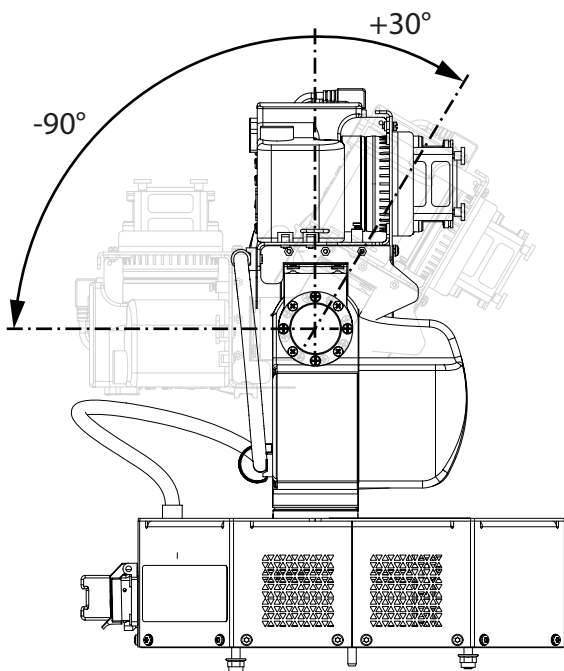


Image 6-10
AutoAlignment Head (rugged version) : Tilt range

6.3 Camera FOV

Camera FOV (Field Of View)

The Horizontal and the Vertical Field of View of the camera are

- Camera HFOV: 64°
- Camera VFOV: 45°



These Camera FOV's correspond to an 18 mm zoom setting on the lens.

7. INSTALLATION

About this chapter

This chapter describes the full installation flow which is a one time operation only: mechanical installation, connectivity, upload of the correct calibration files for the spectrometer and settings on the Camera.

The AutoAlignment Head can be fixed using the M6 mounting studs, washers and nuts at its bottom. It can be used in table mount or ceiling mount mode.



CAUTION: The AutoAlignment Head standard version has not been designed to be used on a motion base platform.

Overview

- Mechanical installation
- Hardware connections
- Driver installation
- Uploading the calibration files
- Importing the license file
- Camera settings
- AutoAlignment parameters

7.1 Mechanical installation



CAUTION: Hold the unit at the bottom box to lift and move it. Never hold the camera or Gimbal to lift the AutoAlignment Head.

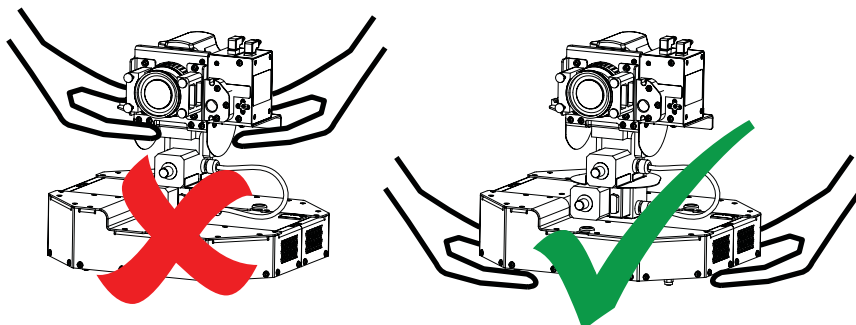


Image 7-1
Lifting instructions: AutoAlignment Head (standard and rugged) version



CAUTION: Disconnect the mains power supply during the AutoAlignment Head installation. Doing not so may cause electric shock.



The mechanical support must be solid enough to sustain the weight of the AutoAlignment Head and that it is in a good and safe location and position. It should have a positioning hole and three fixation holes. See "Dimensions", page 25.



WARNING: The AutoAlignment Head must be instantly and correctly fixated to its mechanical support during installation.



WARNING: Make sure that the AutoAlignment Head is instantly secured when it is mounted in ceiling mode (i.e. hanging upside down). Improper fixation may cause personal injury or device damage.

Necessary tools

Open ended nut spanner 10 mm

How to mount the AutoAlignment Head on a mechanical support?

1. Disconnect the power cable and the SFTP Cat.5e cable from the AutoAlignment Head.
2. Loosen and remove the M6 mounting nuts (3x) and washers (3x) from the M6 mounting studs on the AutoAlignment Head.

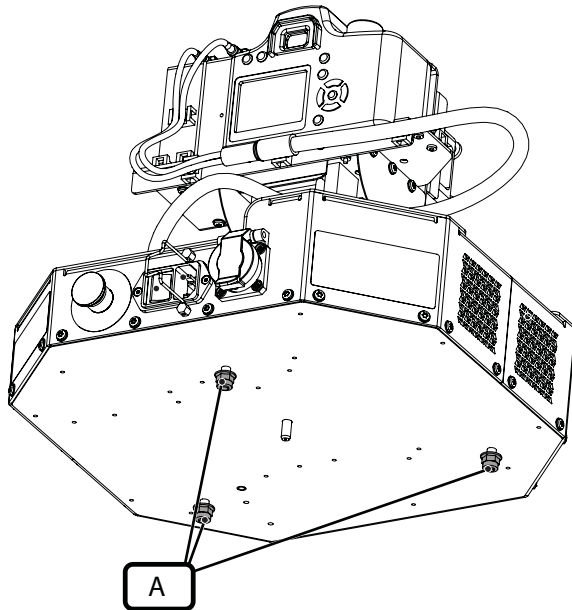


Image 7-2

A M6 nuts and washers (3x)

3. Align the location pin of the AutoAlignment Head to the positioning hole on the mechanical support and slide it in.

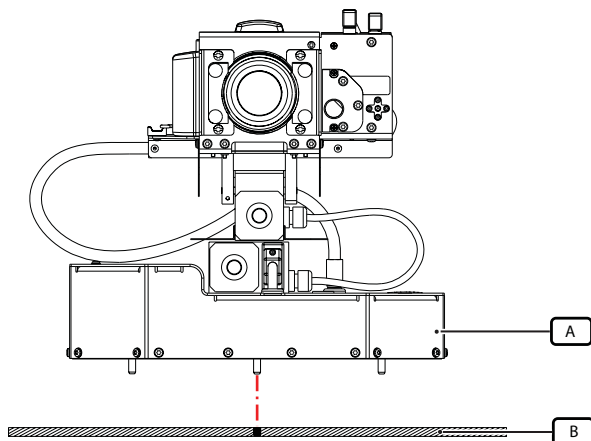


Image 7-3

A AutoAlignment Head
B Mounting plate

4. Orient the AutoAlignment Head until its M6 mounting studs are aligned with their respective fixation holes in the support.

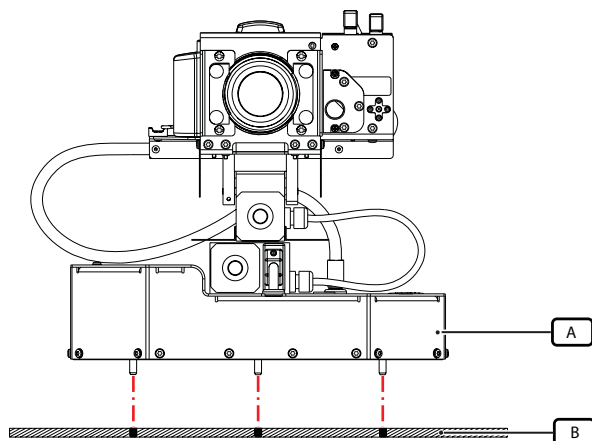


Image 7-4

A AutoAlignment Head
B Mechanical support

5. Insert the mounting studs in their respective holes

6. Install the washers (3x) and screw on the M6 nuts (3x) to fix the Barco to the mechanical support.

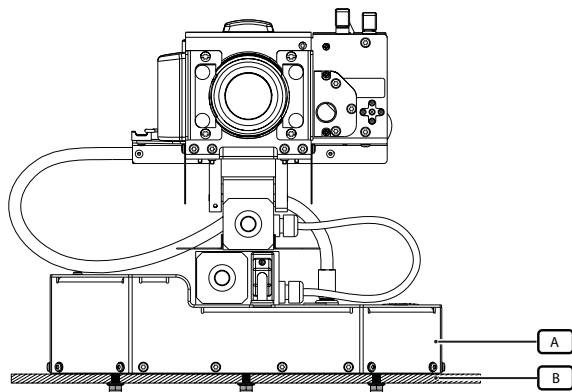


Image 7-5

A AutoAlignment Head
B Mechanical support

7. Connect all the power cable and the SFTP Cat.5e cable to the AutoAlignment Head.

7.2 Hardware connections

Overview

- Preparing SFTP Cat.5e cable
- Power connections
- Connecting the LEX unit to the MCU
- Connecting the SFTP Cat.5e cable
- Connection diagram



CAUTION: Disconnect the mains power supply during the AutoAlignment Head installation. Doing not so may cause electric shock.

7.2.1 Preparing SFTP Cat.5e cable

Necessary parts

- Ferrites: B195382 (2x)
- Warning label: R870792 (2x)

How to prepare SFTP Cat.5e cable?

1. Make a loop at one end of the cable.

Image 7-6
preparation: making a loop

2. Fix this loop using ferrite as indicated in the picture below.

Image 7-7
preparation: fixing the loop

3. Repeat steps 2 and 3 at the other end of this cable.

Image 7-8
preparation: fixing the loop at the other end of the cable

4. Put one end of the cable in. the middle of warning label as indicated in the picture below.
Note: This warning label is an adhesive PVC film.

Image 7-9
preparation: placing the cable on the warning label

5. Fold this warning label so that the cable is stuck in between this label.

Image 7-10
preparation: fixing the warning label

6. Repeat steps 4 and 5 at the other end of this cable.

Image 7-11
preparation: fixing the warning label at the other end of the cable

7.2.2 Power connections

How to connect the power to the MCU?

1. Connect the supplied power cable to connect the MCU to the power outlet.
2. Plug the female power connector into the male connector at the rear of the MCU.



Image 7-12
Connectors: mains power (MCU)

How to connect the power to the AutoAlignment Head?

1. Connect the supplied power cable to connect the AutoAlignment Head to the power outlet.
2. Plug the female power connector into the male connector at the rear of the AutoAlignment Head.

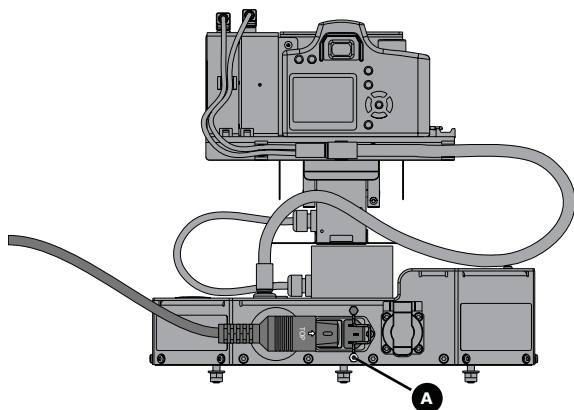


Image 7-13
Connectors: mains power (AutoAlignment Head)

- Secure the connection with the locking buckle. See label A



CAUTION: Only use the original power cables.



CAUTION: Never use a power cable that is damaged. Replace it by a new original one.

7.2.3 Connecting the LEX unit to the MCU

How to connect the LEX unit to the MCU?

- Place the LEX unit close to the MCU.
- Connect the LEX unit USB cable (male plug) directly to one of the USB ports (female connector) on the MCU. See image 7-14.
Note: Do not connect the LEX unit to the MCU via a USB hub.

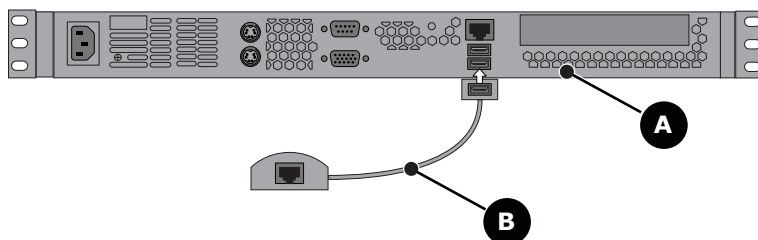


Image 7-14
A MCU
B LEX unit

7.2.4 Connecting the SFTP Cat.5e cable



Make sure that both ends of the SFTP Cat.5e cable are looped and that the warning labels are attached at both ends.

How to connect the SFTP Cat.5e cable?

- Connect one end of the supplied SFTP Cat.5e cable to the LEX unit.

7. Installation

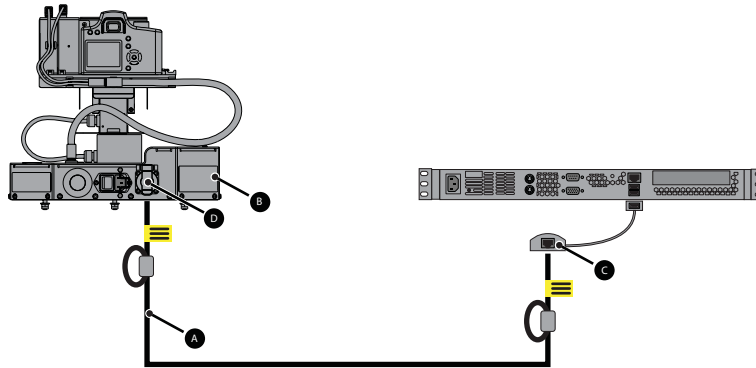


Image 7-15
Connecting SFTP Cat.5e cable to LEX unit

- A SFTP Cat.5e cable
- B AutoAlignment Head
- C LEX Unit
- D RJ 45 connector lid close

2. Open the lid and connect the other end of the supplied SFTP Cat.5e cable to the AutoAlignment Head.

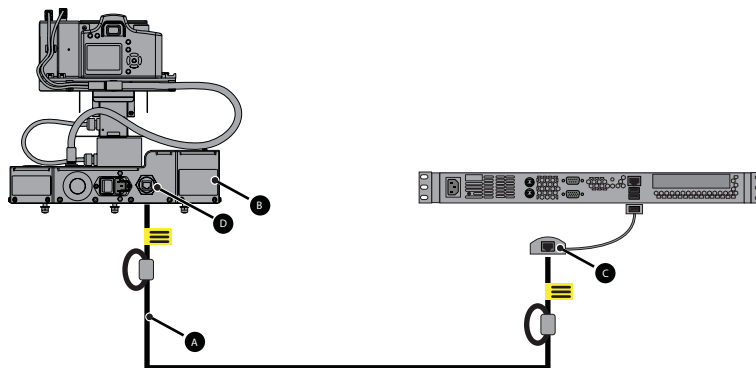


Image 7-16
Connecting SFTP Cat.5e cable to LEX unit

- A SFTP Cat.5e cable
- B AutoAlignment Head
- C LEX Unit
- D RJ 45 connector lid open

7.2.5 Connection diagram

Diagram

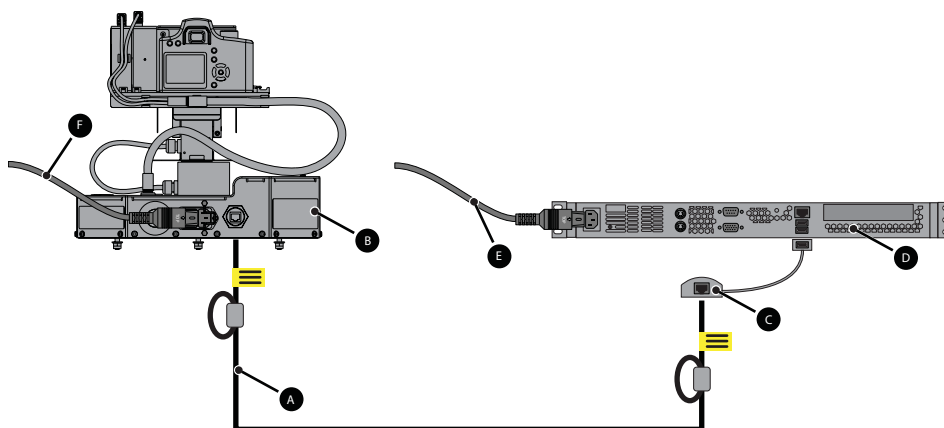


Image 7-17
Connection diagram

- A SFTP Cat 5e cable
- B AutoAlignment Head
- C LEXUnit
- D MCU
- E Power to the XDS RACU MCU from the mains power supply (wall outlet)
- F Power to the AutoAlignment Head from the mains power supply (wall outlet)

7.3 Driver installation

Driver installation

By default the drivers for the AutoAlignment Head (laser, spectrometer and camera) are installed on the MCU by the time of delivery. No additional action is required.

Only in case of hard disk replacement in the MCU, it is required to run one executable to install all drivers again.

Article number	File name	Download from
R33224600	MCUAutoAlignHardwareDrivers.exe	TDE on Barco's Intranet
		Barco's secured website: https://my.barco.com

7.4 Uploading the calibration files

Overview

- Uploading the spectrometer calibration file
- Uploading the camera calibration file

7.4.1 Uploading the spectrometer calibration file

Overview

A set of calibration data is required to guarantee accurate measurements of the spectrometer. This calibration data is available in the calibration file (<filename>.cal) on the CD-ROM (created by Ocean Optics) which is delivered with the AutoAlignment Head. The CD ROM label typically includes the serial number of the spectrometer, e.g. USB4F03653.

The calibration file must be uploaded to the MCU, prior to connecting the spectrometer to the MCU.

It is possible to connect more than one spectrometer to a single MCU; In this case the user needs to manually create a folder on the MCU for each spectrometer. The name of each folder must be the serial number of the corresponding spectrometer. E.g. C:\Program Files\Barco\XDS\Resources\Spectrometer\USB4F03653.



It is advised to store the calibration files of all owned spectrometers on all owned MCU's: in that situation, you can freely use each AutoAlignment Head in any display system.

How to upload the spectrometer calibration file?

1. Run the Barco delivered CD on the MCU.
2. Copy the correct spectrometer calibration file called <filename>.cal.
3. Save the spectrometer calibration file to the correct location on the MCU, without changing its name:
C:\Program Files\Barco\XDS\Resources\Spectrometer\<serial number>, where <serial number> is the serial number of the corresponding spectrometer
Tip: If this folder does not exist yet, it must be manually created.

Getting the serial number of the spectrometer

If the spectrometer has already been connected to the XDS RACU, stop and restart the XDS RACU software on the MCU. Once the XDS RACU server is running again, the serial number of the spectrometer can be read from the XDS RACU Server Console:

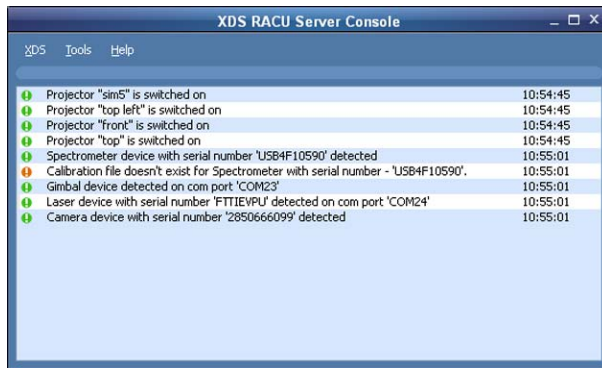


Image 7-18
XDS RACU Server Console

The serial number of the spectrometer can also be read from the label on it:

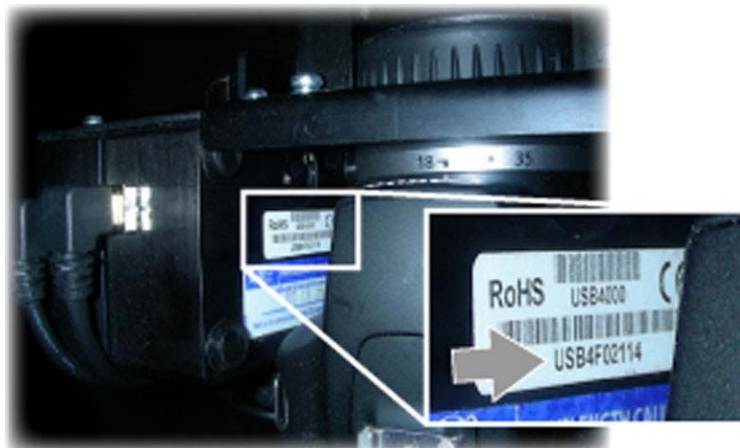


Image 7-19
Spectrometer: serial number

7.4.2 Uploading the camera calibration file

Overview

By default, the camera is fully calibrated and no further action is required to guarantee correct measurements. For future applications, it might be required to upload a new calibration file to the MCU. At that time, the calibration file will be provided by Barco.

How to upload the camera calibration file?

1. Save the camera calibration file to the following location on the MCU, without changing its name
 - C:\Program Files\Barco\XDS\Resources\Camera<serial number>.

Getting the serial number of the camera

If the camera has already been connected to the XDS RACU, stop and restart the XDS RACU software on the MCU. Once the XDS RACU server is running again, the serial number of the camera can be read from the XDS RACU Server Console:

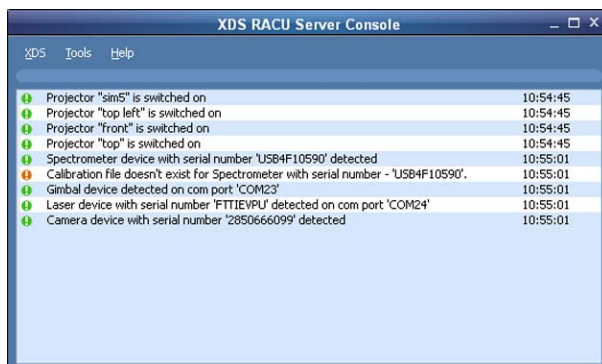


Image 7-20
XDS RACU Server Console

7.5 Importing the license file



The license file is linked to – amongst other things – the hostname of the computer on which the according software is running. As a result, a new license file is required when the hostname of this computer is changed.

Overview

A license file is required to run the XDS RACU software. The user has to send a request to Barco for the license file explicitly mentioning the feature(s) required: Acuras, OmniBlend and/or AutoGeometry.

How to import the license file?

1. See the XDS RACU user guide **R59770508** for more information.

7.6 Camera settings

Overview

- Fixed camera settings
- Lens cap
- Zoom
- Focus

7.6.1 Fixed camera settings

Camera settings

To guarantee proper working, the camera settings should never be changed! The default settings of the various selection switches are listed below:

- Power switch: **ON**
- Rotary dial position: **M**
- Focus selection switch on the camera lens: **MF**

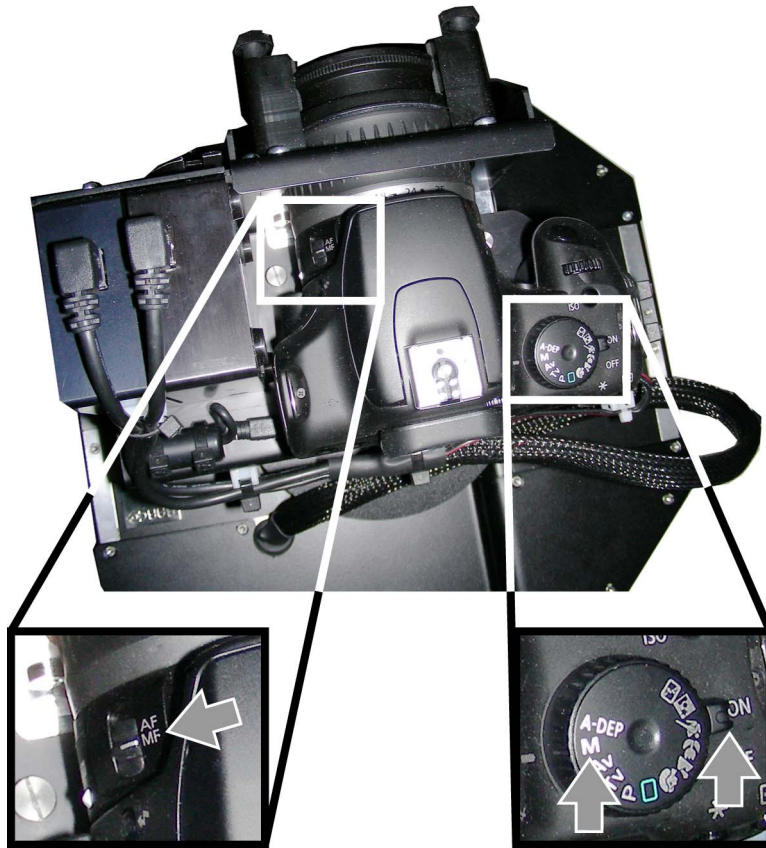


Image 7-21
Camera settings

7.6.2 Lens cap

Lens cap setting

Remove the lens cap before turning on the camera. If you turn on the camera before removing the lens cap, no image will be visible when looking through its ocular.

7.6.3 Zoom

Zoom setting

By default, zoom has been set to 18 mm (Wide view) in the factory and doesn't need to be changed. If you decide that zoom setting should be changed in a specific application, adjust it prior to setting focus.

Necessary tools

Torx screwdriver T20

How to adjust the zoom setting?

1. Loosen the four screws fixing the zoom ring brackets half a turn anticlockwise. See label 1

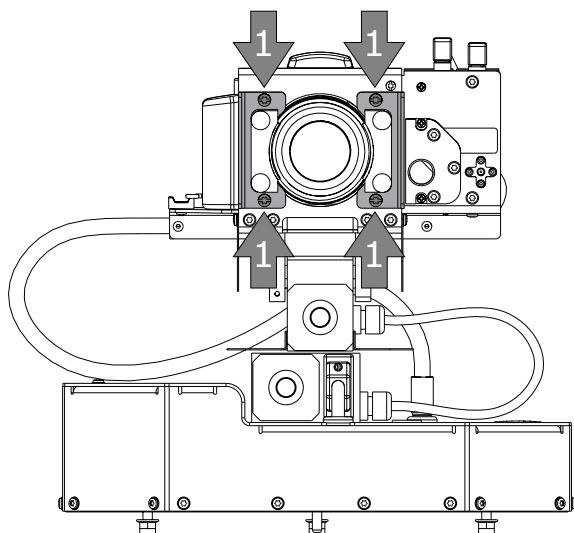


Image 7-22
Zoom: loosening the four screws

2. Turn the zoom ring to set to the desired zoom.
3. Push the zoom ring brackets against the lens (see label 1) and tighten four screws to fix the zoom ring brackets (see label 2).

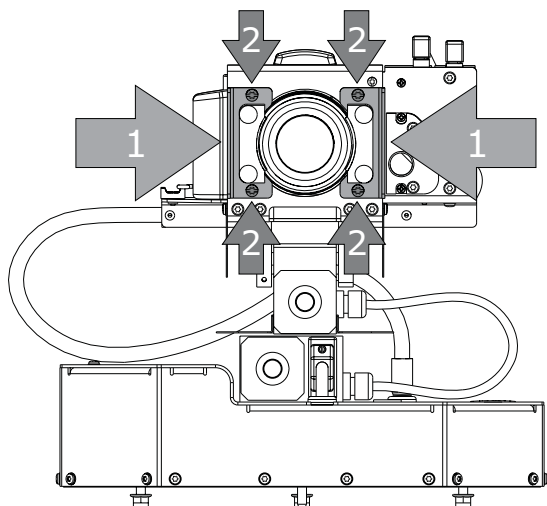
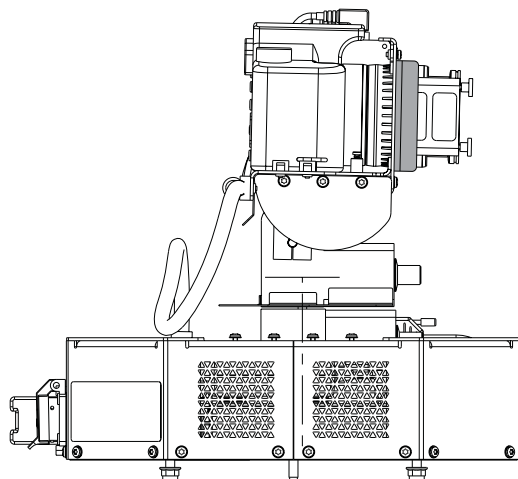


Image 7-23
Zoom: tightening the four screws



7.6.4 Focus



Prior to adjusting focus, make sure the camera lens is set to MF (Manual Focus). See image 7-21.

How to adjust the focus setting?

1. Loosen the four screws fixing the focus ring brackets half a turn anticlockwise. See label 1

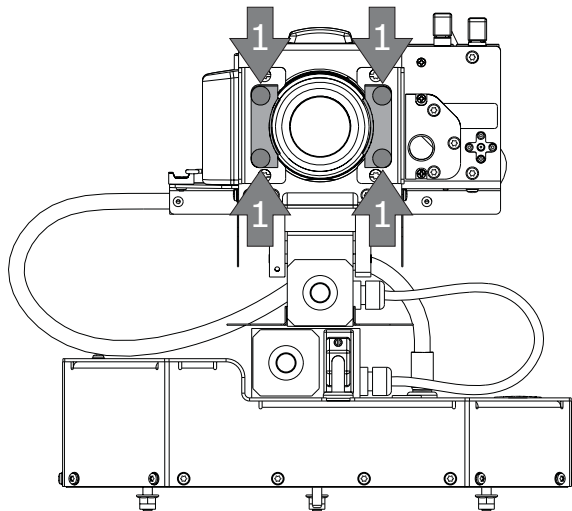


Image 7-24
Focus: loosening 4 thumbscrews

2. Turn the focus ring to set to the required focus.
Note: *If the distance between camera and different points on the screen varies, then set the focus to the average distance to the screen.*
3. Push the focus ring brackets against the lens (see label 1) and tighten the thumbscrews to fix the focus ring brackets (see label 2).

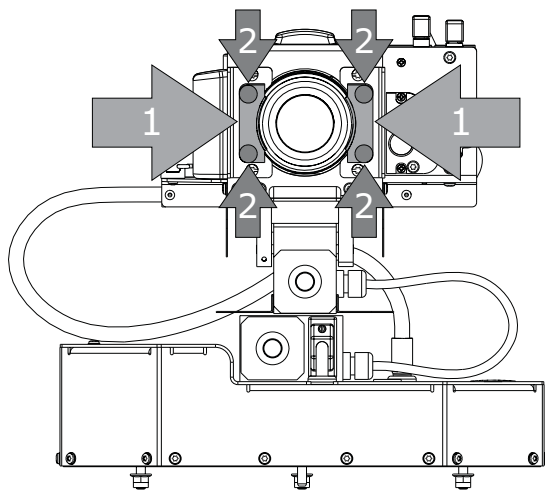
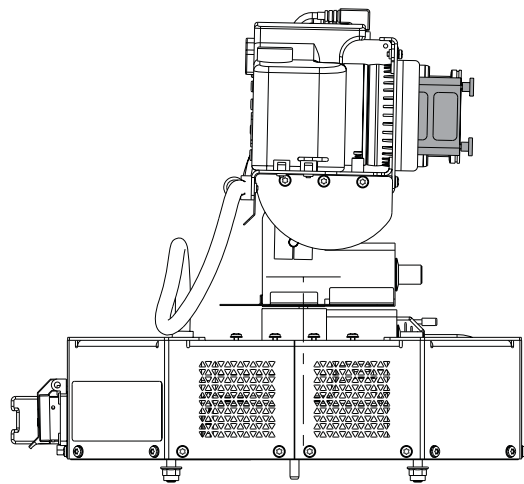


Image 7-25
Focus: tightening 4 thumbscrews



7.7 AutoAlignment parameters

Overview

The AutoAlignment parameters on the Options page of the XDS RACU user interface are informative only. The password protected AutoAlignment parameters may only be changed by authorized Barco personal.

Options

Projector Initialization | Projector Power | Add/Remove Device | Replace Device | Auto Alignment

Auto Alignment Options

General | **Acuras** | Auto Geometry | OmniBlend | Warp Auto Geometry

Red channel ratio margin: 0.010

Green channel ratio margin: 0.020

Blue channel ratio margin: 0.025

Start Multipoint Fade-out: 0.2

Stop Multipoint Fade-out: 0.4

Integration time warning level: 1000000

Integration time error level: 2000000

Maximum dimmer: 8000

Password protected Auto Alignment parameters may only be changed by authorized Barco personnel.

Save Settings | Set Defaults | Enter Password

Feedback

Image 7-26
AutoAlignment settings: Acuras parameters

Options

Projector Initialization | Projector Power | Add/Remove Device | Replace Device | Auto Alignment

Auto Alignment Options

General | Acuras | **Auto Geometry** | OmniBlend | Warp Auto Geometry

Corner Detection | Mapping

1st Pass

Smoothing Size [camera pixels]:

Canny Edge Detection

Threshold1:

Threshold2:

Hough Transform

Rho precision [camera pixels]:

Theta Precision [PI/x radians]:

Threshold [camera pixels]:

Min line length [camera pixels]:

Max line gap [camera pixels]:

Edges corners

Max edge width [camera pixels]:

Max corner distance [camera pixels]:

Min corner angle [degrees]:

2nd Pass

Outout radius [camera pixels]:

Hough Transformation

Theta precession [PI/x radians]:

Threshold [camera pixels]:

Password protected Auto Alignment parameters may only be changed by authorized Barco personnel.

Save Settings | Set Defaults | Enter Password

Feedback

Image 7-27
AutoAlignment settings: AutoGeometry parameters

Options

Projector Initialization | Projector Power | Add/Remove Device | Replace Device | Auto Alignment

Auto Alignment Options

General | Acuras | Auto Geometry | **OmniBlend** | Warp Auto Geometry

System Type: **Rear Projected Dome** ☐ Save Intermediate Images

OmniBlend

CR2 to TIFF wavelet threshold: 500

Projector Mask Erode [iterations]: 2

Partial alpha transition width [pixels]: 50

Auto Exposure

Ignore brightest pixels [%]: 0.01

Dynamic range target [%]: 80

Screen edge cleanup

Close [pixels]: 30

Open [pixels]: 5

Mapping

CR2 to TIFF wavelet threshold: 500

Mapping open/close [iterations]: 2

Number of bits [bits]: 8

Projector Mask

Colourmix threshold: 32768

Focus mask close: 5

Focus mask threshold [%]: 25

Filter duplicate points

Max distance from avg [pixels]: 1.75

Password protected Auto Alignment parameters may only be changed by authorized Barco personnel.

Save Settings | Set Defaults | Enter Password

Feedback

Image 7-28
AutoAlignment settings: OmniBlend parameters

Options

Projector Initialization | Projector Power | Add/Remove Device | Replace Device | Auto Alignment

Auto Alignment Options

General | Acuras | Auto Geometry | OmniBlend | **Warp Auto Geometry**

☒ Enable Warp Auto Geometry

Please select appropriate system type and dot pattern generator

System Type: **Rear Projected Dome** | Dot Pattern Generator: **Polaris**

Image Capture Settings

Reference Dot Detection Settings

Expected Dot Count: 10

Expected Dot Area: 100

Camera Exposure Time: 10000

Binarize Image Threshold: -10

Auto Geometry Dot Pattern Settings

Grid Size: 9x9

Dot Diameter: 27

☐ Keep dots inside edges

Auto geometry Dot Detection Settings

Dot Threshold Value Factor: 2

Vignetting Power: 0.5

Geometry Realign Settings

Max. Realign Tolerance: 1.0

Max. Realign Try Count: 8

☒ Adjust Warp Boundaries

Password protected Auto Alignment parameters may only be changed by authorized Barco personnel.

Save Settings | Set Defaults | Enter Password

Feedback

Image 7-29
AutoAlignment settings: Warp AutoGeometry parameters



CAUTION: Make sure that you have selected the correct display system type “*Rear Projected Dome* or *Cross Cockpit Collimated Display*” from the System Type drop down box, prior to changing and saving the corresponding system type Omniblend parameters.



CAUTION: Make sure that you have selected the correct display system type “*Rear Projected Dome* or *Collimator with Slide Projector*” from the System Type drop down box, prior to changing and saving the corresponding system type WarpAutoGeometry parameters.

8. GETTING STARTED

About this chapter

In this chapter, we describe the procedures that are required to come to an AutoAlignment Head that is ready to be operated. It is assumed that the XDS RACU MCU and eRACU are fully connected, installed and configured and that the AutoAlignment Head is fully installed as well (see previous chapter).

After having powered the full system and having selected the correct Display system from the User Interface, plugins for the Camera, Spectrometer and Gimbal must be enabled in the XDS RACU software and the Gimbal home position can be changed.

In applications where it is required to have multiple physical positions where the AutoAlignment Head can be installed, these positions must be defined. This can be the case if a mechanical module (e.g. cockpit, metal beams) is in part obstructing the Field of View of the AutoAlignment Head.

In a next step, the operator must define the locations on the projected image where the Spectrometer and Camera should be pointed at during measurements, and learn those positions to the AutoAlignment Head. For Dynacolor measurements and gray level correction, 1 single point is used, for uniformity corrections multiple points need to be defined.

Finally the ECR (Enhanced Contrast Ratio, or adjustable iris in the projection lens) can be calibrated if available. Now the AutoAlignment Head is fully ready to be operated.

Overview

- Starting up the MCU, eRACU and AutoAlignment Head
- Connecting to a display
- Configuring the software
- Defining multiple head location
- Setting Gimbal Home Position
- Defining positions
- ECR calibration

8.1 Starting up the MCU, eRACU and AutoAlignment Head

Overview

Follow the startup sequence mentioned below.

- MCU
- eRACU
- AutoAlignment Head

It is assumed that all hardware connection related to MCU, eRACU and AutoAlignment Head have been completed.

8.1.1 Starting up the MCU

How to start up the MCU?

Switch on the power switch.



Image 8-1
Starting up the MCU



It is not required to log in on Windows on the MCU in order for the eRACU to connect to the XDS RACU server.



CAUTION: In order to use the camera functionality in AutoAlignment, one should either boot the MCU and stay logged out of Windows or permanently stay logged in on Windows during usage of AutoAlignment. A limitation of the camera driver makes it inaccessible after a Windows logoff event. One should either reboot or re-login to be able to use the camera functionality again after a Windows logoff.

8.1.2 Starting up the eRACU

How to start up the eRACU?

Switch on the eRACU by pressing the power button for 2 seconds.



Image 8-2
Starting up the eRACU

8.1.3 Starting up the AutoAlignment Head

How to start up the AutoAlignment Head?

Switch the power switch to 1 as indicated in the picture below.

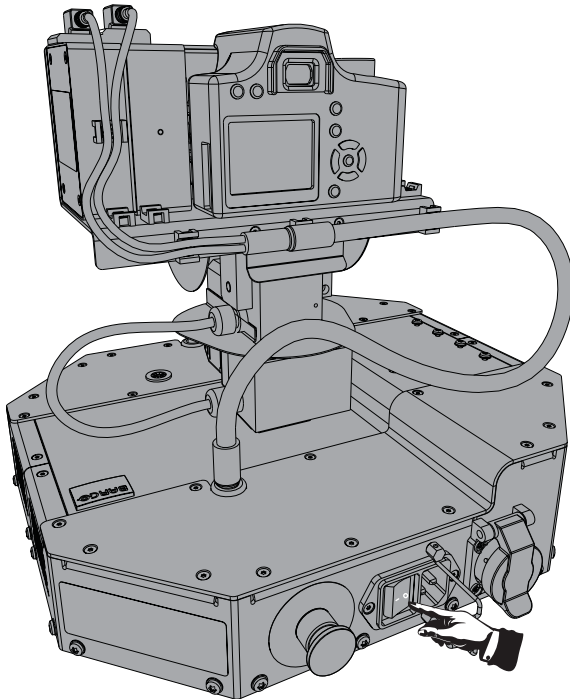


Image 8-3
Starting up the AutoAlignment Head

8.2 Connecting to a display



In the display dialog (see below), different display types can appear. The AutoAlignment Head is only used on a Simulator display type. It can not be used on a display (e.g. Powerwall), which is a computer running an XDS installer.

How to connect to a display?



1. Press the XDS RACU icon on your eRACU desktop.

The *Display* dialog will appear.

2. On the display dialog, select the display which you want to connect.



Image 8-4
Connection dialog

Note: Use the navigation arrows on the right to scroll through the display list.

3. Press the **Connect** button to connect to the selected display.

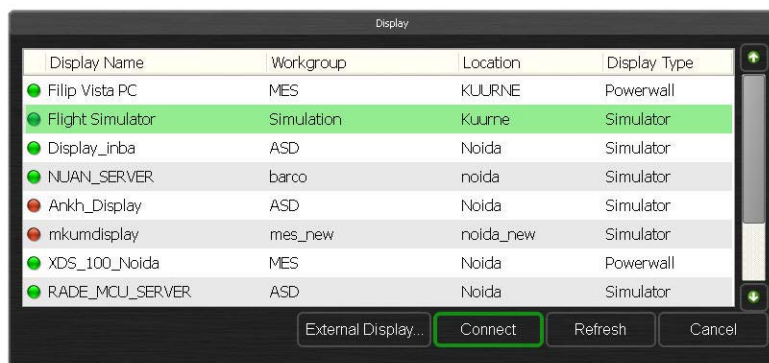


Image 8-5
Connect: button

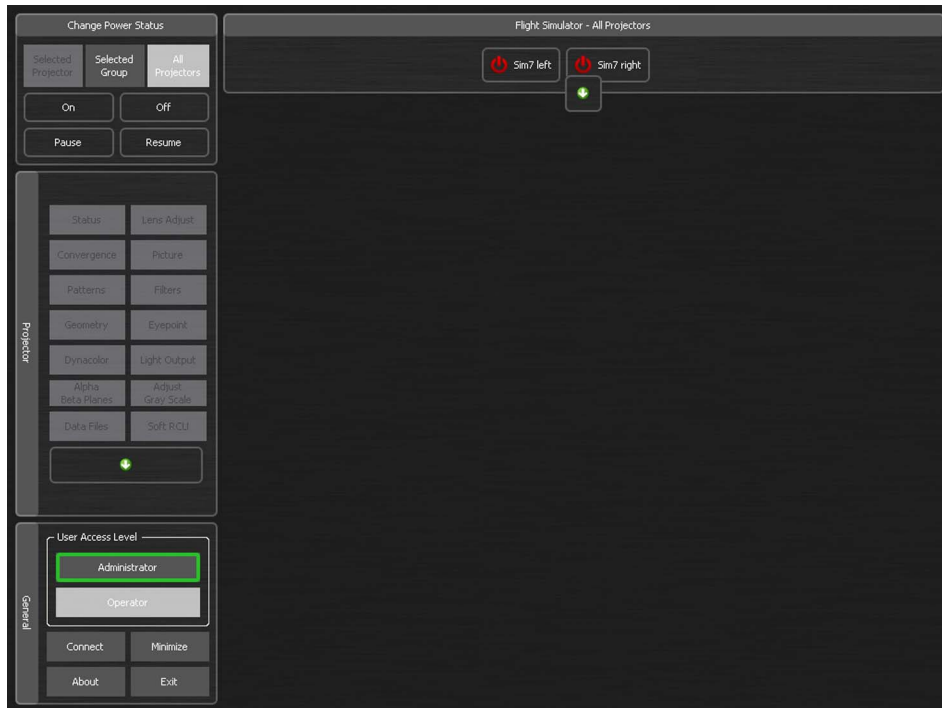


Image 8-6
Main page of the XDS RACU for the selected display is displayed

8.3 Configuring the software

Overview

Configuration of software is the checking of the desired plugins checkbox in the *Options* page.



Note that the separate plugins are used for the Acuras, AutoGeometry and OmniBlend submodules. A specific license file must be bought with XDS RACU for this.

How to configure the software?

1. In the *Options* page, navigate to *Add/Remove Device > Plugin Management*.
2. Check the desired plugins to activate them.

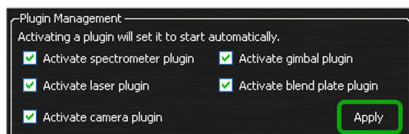


Image 8-7
Activating the plugins

3. Press the button **Apply** to confirm and save the setting.

8.4 Defining multiple head location



Head location

The physical position of the AutoAlignment Head. Multiple Head Locations are required if it is not possible or not desirable to cover the full display system image from one single physical location.

Overview

From this page you can define multiple head locations. In a display system, the AutoAlignment Head is typically located at the eye point; however, in some cases there might be object(s) that block the spectrometer and camera field of view when executing Acuras/ AutoGeometry/OmniBlend capture or realign. In this case, the user can define alternative head locations and physically position the AutoAlignment Head in the display at the corresponding defined head location. Furthermore, you can rename the existing head location name as desired.



By default the Head Location "Default" is always selected, if no additional head location is selected or created.

How to define the head location?

1. In the *Options* page, navigate to *Auto Alignment > General*

The screenshot shows the 'Options' window with the 'Auto Alignment' tab selected. Under 'Auto Alignment Options', the 'General' sub-tab is active. The 'Measurement Head Location' section has a dropdown menu currently showing 'Default'. To the right of the dropdown are three buttons: 'Add', 'Rename', and 'Delete'. The 'Add' button is highlighted with a green rectangular box. Below this, there are input fields for 'Pan(degrees)' and 'Tilt(degrees)', both set to 0, and a 'Save' button. Further down, there are 'Camera Settings' including 'Initial exposure time' (10000), 'Auto Exposure threshold' (229), and 'Liveview Auto Exposure percentage' (50). At the bottom, there are buttons for 'Save Settings', 'Set Defaults', and 'Enter Password'.

Image 8-8
Options page: defining the head location

2. In the section *Measurement Head Location*, enter the desired head location name

This is a close-up of the 'Measurement Head Location' section. The dropdown menu is open, and 'Head Location 1' is selected. The 'Add' button is highlighted with a green rectangular box. The text above the dropdown explains that alternative head locations can be created for cases where a single AutoAlignment Measurement Head needs to be placed in different physical locations inside a simulator.

Image 8-9
Naming the head location

Note: For the Head location names, the same rules apply as standard Windows files names. No special characters are allowed.

3. Press **Add** to save the new head location name

This is another close-up of the 'Measurement Head Location' section. The dropdown menu is still open, showing 'Head Location 1'. The 'Add' button is highlighted with a green rectangular box. The 'Rename' and 'Delete' buttons are also visible.

Image 8-10
Adding the head location

How to rename the Head Location name?

1. In the *Options* page, navigate to *Auto Alignment > General*
2. Select the existing head location to be renamed

8. Getting started

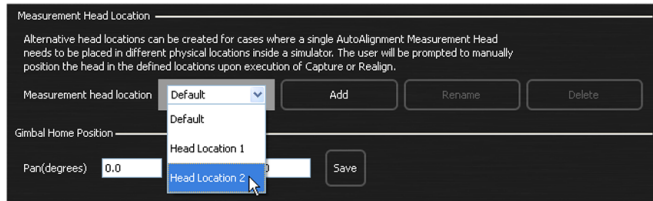


Image 8-11
Selecting the head location

3. Rename the selected head location as desired

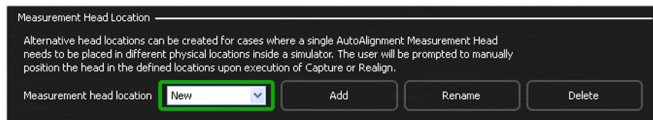


Image 8-12
Renaming the head location

4. Press **Rename** to save the renamed head location

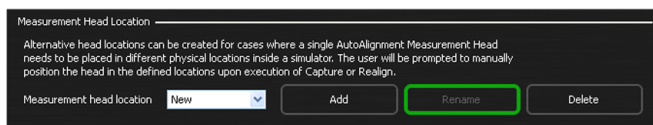


Image 8-13
Saving the renamed head location



Use the Delete button to delete an existing head location. The following Warning dialog will appear.

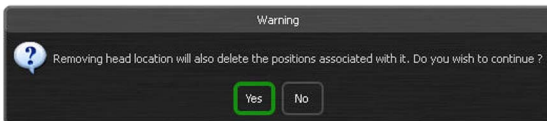


Image 8-14



If a head location which is in use by an Acuras, OmniBlend or AutoGeometry position is deleted, the capture data for that position will be lost and the head location for that position will be set to the Default location. Capture must then be executed again for that position before realignment can be performed.

8.5 Setting Gimbal Home Position

Overview

The setting Gimbal Home Position feature allows the user to define a home position for the Gimbal: Pan and/or Tilt values (in degrees) can be set and saved.

If a setting has been saved, the Gimbal will return to this Pan and Tilt position, after an Acuras Capture or Realign or after an AutoGeometry Capture or Realign.

Navigate to *Options > Auto Alignment > General > Gimbal Home Position* in the XDS RACU GUI to access this feature.



Image 8-15
Gimbal Home Position



By default the defined home position for the Gimbal Pan and Tilt values is 0 degrees and should only be changed if it is really required.

8.6 Defining positions

Overview

- Displaying the Positioning Page
- Acuras position
- AutoGeometry position: Faceted display
- AutoGeometry position: Warp display
- OmniBlend position



After power up of the AutoAlignment Head it is not possible to move the Gimbal until a Reset Gimbal has been executed. The movement arrows on the Position page are then grayed out. Before creating Acuras/OmniBlend/AutoGeometry positions, the user should manually reset the Gimbal on the Position page after power up. Upon running Acuras/OmniBlend/AutoGeometry capture or realign, the user will be prompted to first execute a Gimbal reset. Reset approximately takes one minute.



Image 8-16
Gimbal reset



If you move to different pages or switch off the projectors without saving a new position or a modified selected position, the following confirmation dialog will appear.



Image 8-17

8.6.1 Displaying the Positioning Page

How to display the Positioning Page?

1. Open the main page of the XDS RACU user interface.
2. Optional: Select a projector (or group).
3. Navigate to *Projector > Position Page* and press it.

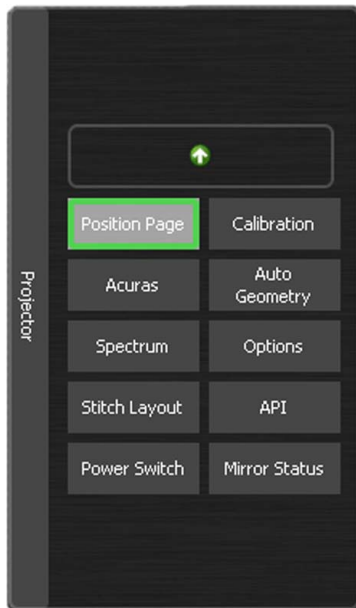


Image 8-18
Pressing the Position Page button

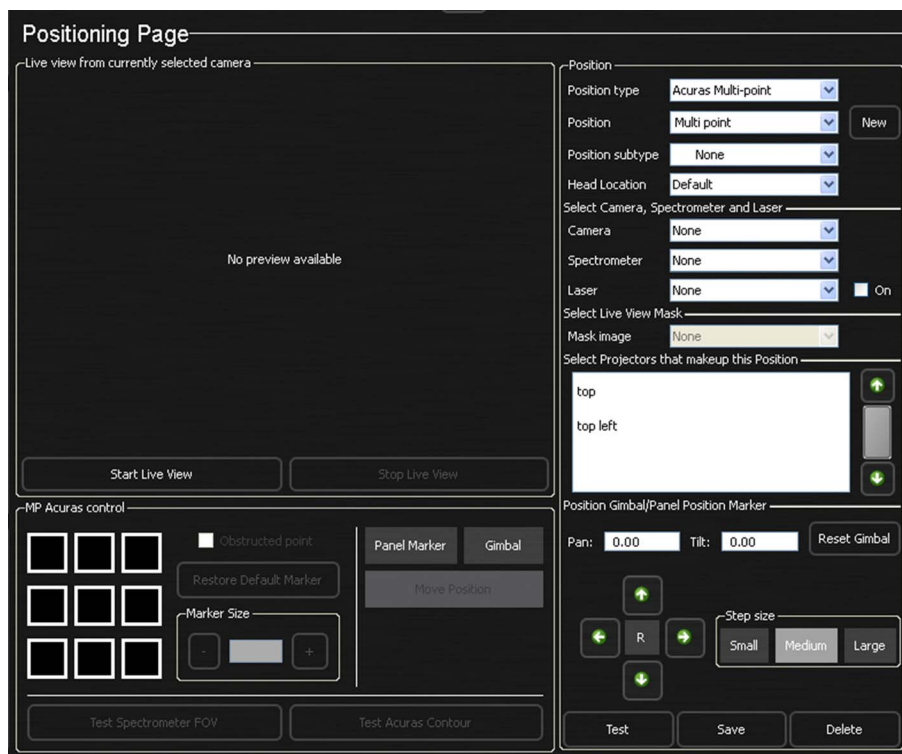


Image 8-19
Positioning Page is displayed.

8.6.2 Acuras position



Acuras position

A set of configuration data needed for Acuras operations on a channel. This set includes Panel Markers, Gimbal Orientations, channel name etc.

Overview

- Defining Acuras 1-point position
- Defining Acuras Multi-point

8.6.2.1 Defining Acuras 1-point position

Acuras 1-point

In case of 1-point position, one single reference point per channel will be defined as reference point. At this point the automatic color and brightness measurements for that channel are performed. A good practice is to choose the center of the visible part of the image of the selected channel as reference point. The laser pointer is used to aim the spectrometer to the desired reference point.



Since the laser pointer is installed next to the spectrometer, there will be a small parallax error between the laser pointer and the spectrometer Field of View, depending on the distance to these devices.



If you have defined multiple Head Location in the Options page, then physically position your AutoAlignment Head at the correct head location in the display prior to defining a Acuras 1-point position.

How to define the reference point in case of Acuras 1-point position?

1. Project any image or internal pattern.
2. On the Positioning Page, navigate to *Position > Position type* and select **Acuras 1-point** from the drop down list.

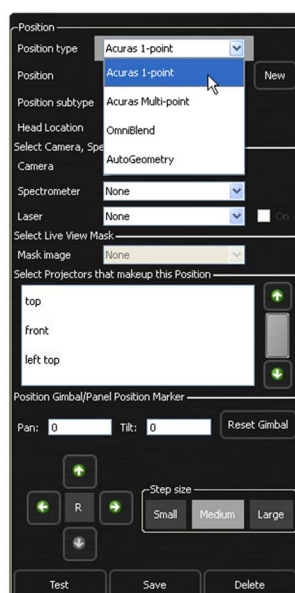


Image 8-20
Position type: Acuras 1-point

3. Press the **New** button to define a new position or select an existing position from *Position* drop down list to change it. For a new position, a name must be entered in the Position edit box.

8. Getting started

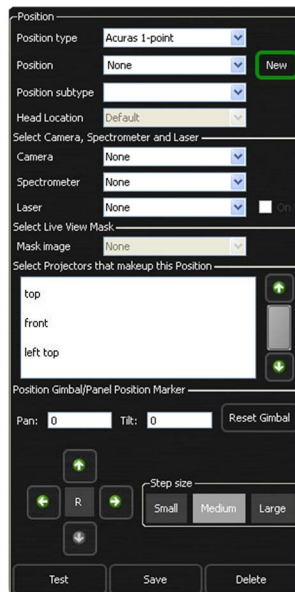


Image 8-21
Creating a new position

Note: Selecting an existing position will highlight the selected projector used in this position.

Note: Use the **Delete** button to delete an existing position, if required. All capture data belonging to this position will be deleted.

Note: If you select an existing position and press the **Test** button, this position is shown as a square on the image and the laser is switched ON and points at the position as it has been defined before.

4. Select the correct AutoAlignment Head location from the *Head Location* drop down list.

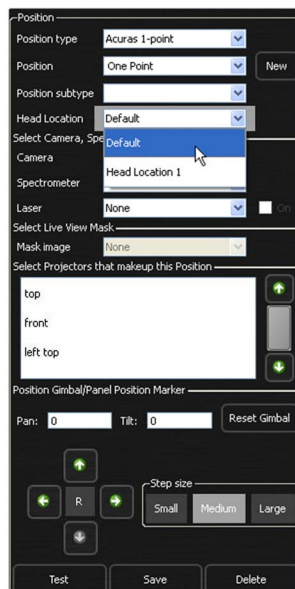


Image 8-22
Selecting the correct Head Location

5. From the *Select Projectors that make up this Position* section, select the projector for which the Acuras1-point position has to be defined.



Image 8-23
Selecting a projector

Note: For each projector only one Acuras position can be defined.

Note: Make sure that the selected projector comes under the Head location that you have selected.

6. From the *Select Camera, Spectrometer and Laser* subsection select the following devices from the drop down lists:

- spectrometer
- laser

Note: The name of the spectrometer and laser is entered in the XDS RACU user interface during definition of the AutoAlignment Head.

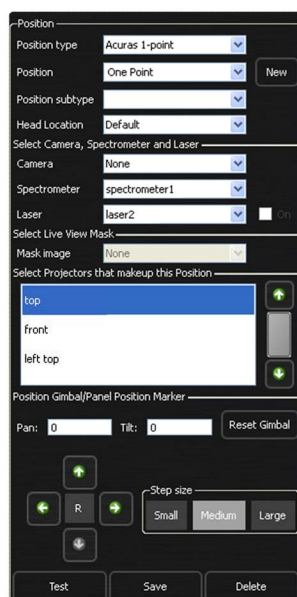


Image 8-24
Selecting spectrometer and laser

7. Check the *Laser* checkbox to switch it ON.

8. Getting started

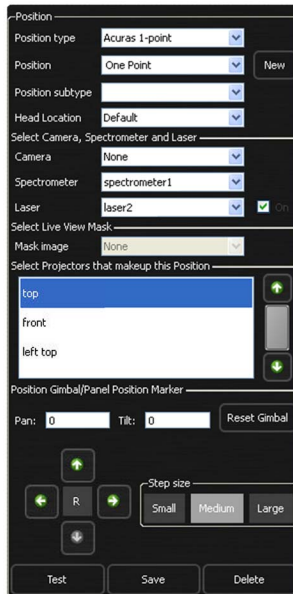


Image 8-25

Laser: switch on by checking the according box

8. Using the Gimbal control arrows to point the laser beam at the center of the visible part of the image.

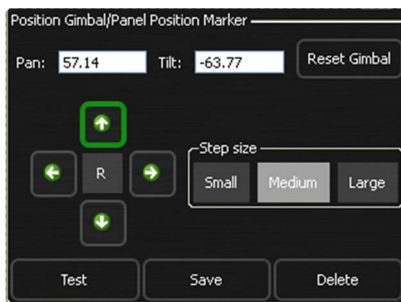


Image 8-26

Gimbal control arrows

Note: Use the **Step size** buttons to increase or decrease the adjustment steps of the Gimbal.

Note: Press the **R** button to control the Gimbal movements using the navigation buttons on the eRACU hand held unit.



Image 8-27

Transferring control to eRACU handheld unit

9. Press the **Save** button.

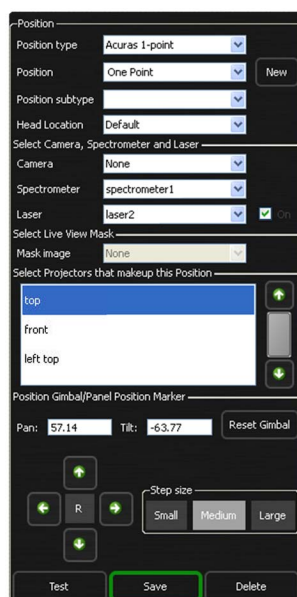


Image 8-28
Saving the Acuras 1-point

If a different AutoAlignment Head location is selected, then you will be prompted to physically position the AutoAlignment Head at the location as indicated in the *Alert* dialog.



Image 8-29
Alert dialog

10. In the appearing *Status information* dialog, press the **OK** button to save the new Acuras 1-point position or the modified selected position.

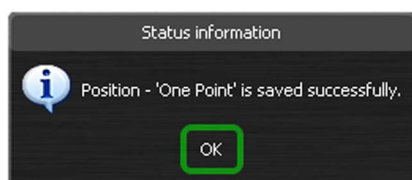


Image 8-30
Saving a new Acuras position

The Gimbal orientation (pan and tilt) is saved along with the selected projector, spectrometer, laser and the selected head location.

8.6.2.2 Defining Acuras Multi-point

Overview

- Description of the Acuras Multi-point
- Defining the Panel Markers
- Defining the Gimbal positions



Acuras Multi-point position is not available for SIM 5W projector.

8.6.2.2.1 Description of the Acuras Multi-point

Introduction

The positions defined in Acuras Multi-point are used to perform white uniformity correction on a projector. Those positions must be defined in such a way that they are well-distributed over the visible part of the projected image of the concerning channel.

Panel Markers are used to indicate the x and y coordinates (in pixels) of the center and the outline of the visible part of the image. These Panel Marker squares must be positioned at well-considered locations on the visible part of the projected image.

Gimbal positions are used to store the orientation (pan and tilt) of the Gimbal head to the Panel Markers.

Panel Markers

In case of Acuras Multi-point position, the user can define five – or seven – reference points, called **Panel Markers** per channel to indicate the visible part of the image. The XDS RACU software then automatically adds four – or two – Panel Markers to come to a total of nine. In case of a triangular image shape, the user defines four reference points and XDS RACU adds three Panel Markers.

Channel image shape	Panel Markers (user defined)	Panel Markers (calculated by the XDS RACU software)
Quadrangular	5	4
Hexagonal	7	2
Triangle	4	3

Panel markers are represented by squares generated in the projector as an overlap on the projected image.



The general goal of Panel Markers is to define capture and realign measurement areas within each display channel. These areas must be well distributed over the projected display channel image.



The position of the Panel Markers must be defined in such a way that they indicate the center and the outer corners and edges of the visible part of the projected channel image. Panel Markers must lay fully within the visible part of the projected channel image and they may not be defined inside the overlap area between two or more channels to avoid interference from other channel images. The tools Test Spectrometer FOV and Test Acuras Contour can be used to find the best position of the Panel Markers in relation to the edges of the visible part of the channel image.

In case of a **quadrangular** visible image area, by default nine Panel Markers are defined: the position of the Panel Markers in the center point and at the four outer corners of the visible part of the image is defined by the user. See labels **C**, **1**, **2**, **3** and **4** on image 8-32. The Panel Markers at the mid points of the four sides are automatically calculated and added by the XDS RACU software. See **1-2**, **2-4**, **3-4** and **1-3** on image 8-32.



The position of the XDS RACU calculated Panel Markers **1-2** and **3-4** cannot be changed by the user. The position of XDS RACU calculated Panel Markers **2-4** and **1-3** can only be changed in a restricted way.



Changing the position of Panel Marker **C**, **1**, **2**, **3** or **4** will change the position of the adjacent side Panel Markers.



When a new Acuras Multi-point is defined, the Panel Markers appear in their default layout, having a quadrangular shape.

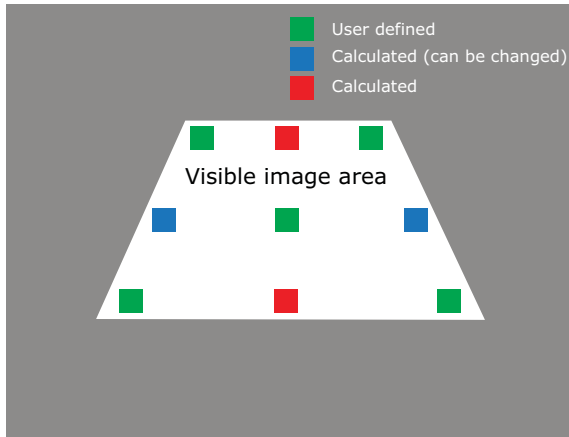


Image 8-31
Acuras multi point: Panel Markers

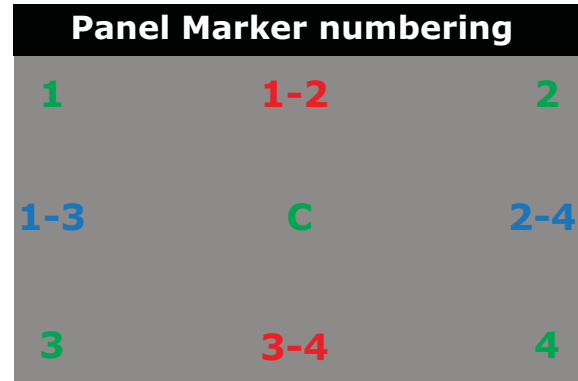


Image 8-32
Acuras multi point: Panel Marker labelling

In case of a **pentagonal** or **hexagonal** visible image area, it is possible to change the position of Panel Markers 1-3 and 2-4 in a restricted way to meet the actual visible part of the projected image.

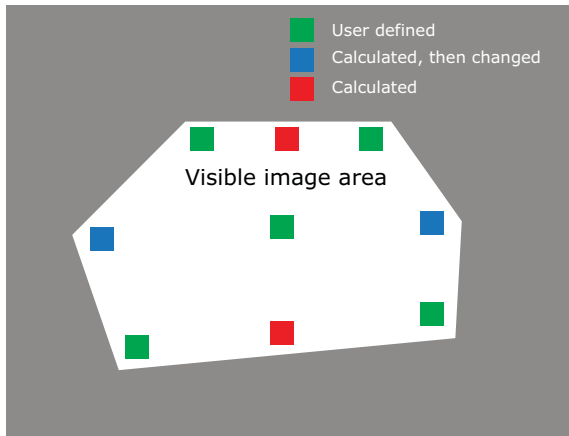


Image 8-33
Acuras multi point: Panel Markers

If one of the corner Panel Markers is moved close towards another Panel Marker or close towards the diagonal of the quadrangular, XDS RACU will automatically convert the quadrangular into a **triangle**, resulting in three corner Panel Markers and a center Panel Marker that are user defined and three side Panel markers that are calculated and positioned by XDS RACU. These ones can not be moved.

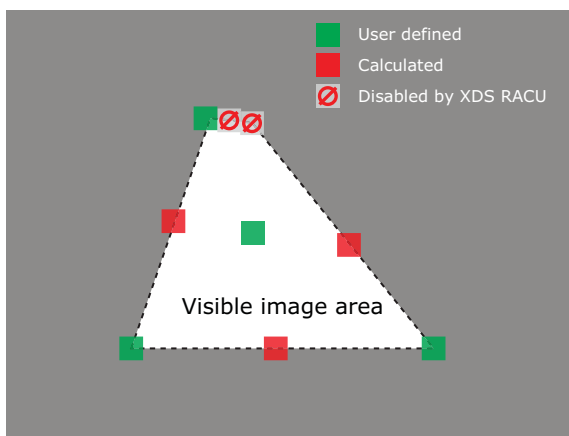


Image 8-34
Acuras multi point: panel markers (triangle)



In case of rear projection or ceiling mode, the ordering might be rotated or mirrored.

Gimbal positions

After the positioning of the Panel Markers, the user must define the corresponding **Gimbal position** for each of them.



Defining Gimbal positions is done by pointing the laser dot to the center of a Panel Marker and 'learn' this Gimbal orientation and direction for that Panel Marker.

As soon as a Gimbal position is stored, the corresponding square in the *MP Acuras Control* section of the Position page in the XDS RACU user interface is indicated by a green check mark. The small red square on the projected image turns green.

If a Panel Marker position is changed after the definition of its Gimbal position, it will be required to redefine one or more Gimbal positions. The ones to be redefined are indicated by the absence of a green check mark in the corresponding squares on the *MP Acuras Control* section of the Position page in the XDS RACU user interface and by red squares instead of green ones on the projected image.

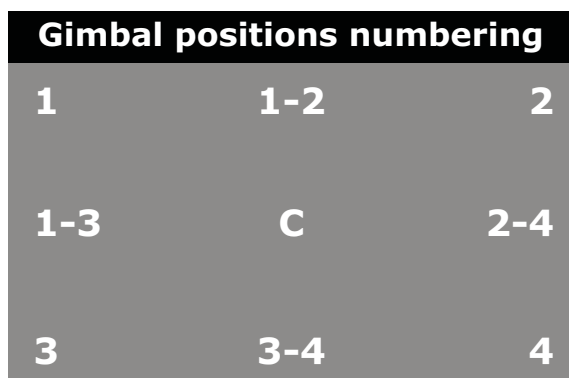


Image 8-35
Gimbal position labelling (quadrangular)

In case of a triangle, only seven **Gimbal Position** need to be defined. See an example in the image below, where it has been assumed that Panel Marker 2 comes close towards Panel Marker 1.

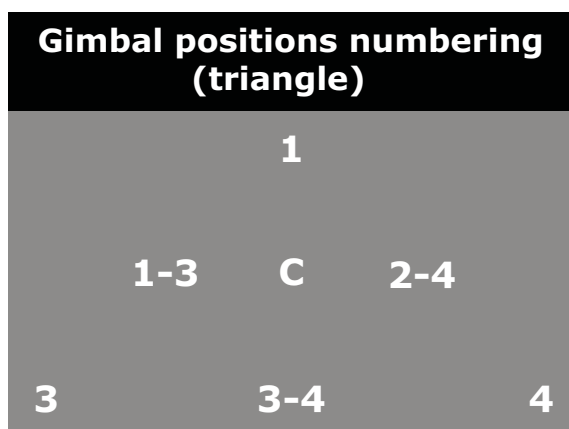


Image 8-36
Gimbal position labelling (triangular)

Additional features

- **Test Spectrometer FOV** : this feature visualizes the Field of View of the spectrometer by moving the laser pointer around the area covered by the spectrometer at the current Gimbal orientation. This feature is used to determine the distance of a Panel Marker to the edge of the visible part of the image. The button is only enabled if the Acuras Multi-point position is defined.
- **Test Acuras Contour** : during Acuras realignment, the results of a Multi-point measurement is interpolated and extrapolated to come to a new set of alignment parameters. Extrapolation however is limited depending on the correction values derived from it, which results in a fade-out of the corrections where the extrapolation becomes less reliable. The Test Acuras Contour button visualizes this fade-out area by means of a green outline.
- **Restore Default Marker** : retrieves the default position of Panel Marker 1-3 or 2-4, i.e. the position that was originally calculated by XDS RACU. The button is only enabled for the quadrangular panel marker set.

8.6.2.2.2 Defining the Panel Markers



Panel Marker

A defined area on a projected channel image. Acuras measurements are to be performed at these areas.

Introduction

By default, five Panel Markers need to be user defined (quadrangular image). Optionally, the position of two of the four additional automatically calculated Panel Markers can be changed.

If a new Acuras Multipoint position is created, the nine Panel Markers appear on the projected image at their default position:

- a moveable Panel Marker is indicated by a white outline having a small green or red square in it on the projected image and by a white outline on the GUI.
- a Panel Marker that can not be moved is indicated by a small green or red square only on the projected image.
- a focused Panel Marker is indicated by a blue background on the projected image and on the GUI: this Panel Marker can be selected to be moved or the Gimbal arrows can be used to jump to another Panel Marker.
- a selected Panel Marker is indicated by a white background on the projected image and on the GUI: the Gimbal control arrows can be used to move its position.
- a small red square in the center of a Panel Marker on the projected image indicates that no Gimbal position is available for this Panel Marker.
- a small green square in the center of a Panel Marker and a green check mark in the GUI indicate that a Gimbal position is available for this Panel Marker.
- in case of a triangular visible image, two Panel Markers are indicated by a thin white outline on the GUI, which means that they are currently coinciding with another Panel Marker and therefore not available.

Next to the definition of the Panel Marker **position**, the Panel Marker **size** can be changed. The recommended size is determined by the area covered by the spectrometer at that particular part of the image on the screen, that in turn is determined by the distance between spectrometer and screen at that location.



The Field of View (FOV) value of the spectrometer currently installed on the AutoAlignment Head is 8 degrees.

The size of each Panel Marker can be individually defined i.e. changing the size of one Panel Marker does not affect or change the size of other Panel Markers.

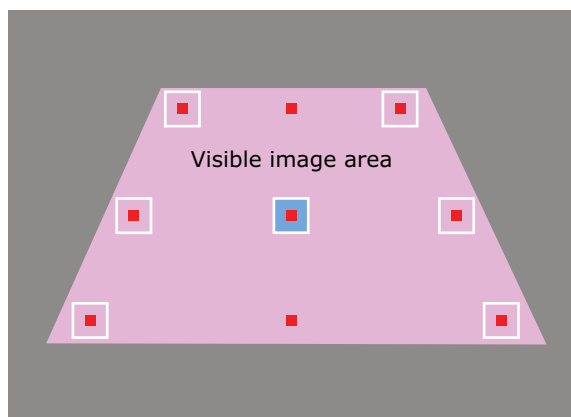


Image 8-37
Panel Markers in the quadrangular shape (Panel Marker Center is focused)



If you have defined multiple Head location in the Options page, make sure that the physical position of your AutoAlignment Head corresponds to the head location in the XDS RACU user interface prior to defining the Acuras Multi-point position.

How to define the Panel Markers?

This procedure applies to the quadrangular image.

1. Project an image.
2. On the Positioning Page, navigate to *Position > Position type* and select **Acuras Multi-point** from the drop down list.

8. Getting started

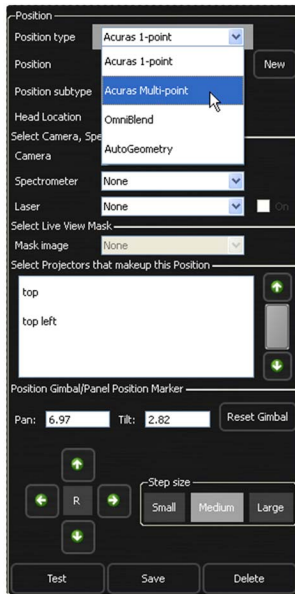


Image 8-38
Position type: Acuras Multi-point

3. Press the **New** button to define a new position or select an existing position from the *Position* drop down list to change it. For a new position, a name must be entered in the Position edit box.



Image 8-39
Creating a new position

Note: Selecting an existing position will highlight the selected projector used in this position.

Note: Use the **Delete** button to delete an existing position, if required. This will cause all capture data for this position to be lost.

Note: If you have selected an existing position and press the **Test** button, the selected existing position is shown as a square on the image and the laser dot is pointing at it. This can be used to check a Gimbal position.

4. Select the correct AutoAlignment Head location from the *Head Location* drop down list.



Image 8-40
Selecting the correct Head Location

Note: Only one AutoAlignment Head location head location is allowed for all Panel Marker positions to be defined for a single Acuras Multi-point position.

- From the *Select Projectors that makeup this Position* section, select a projector for which Acuras Multi-point position has to be defined.

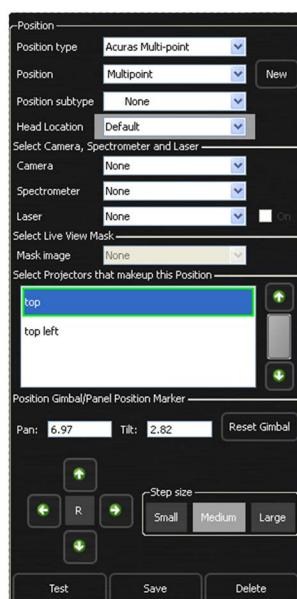


Image 8-41
Selecting a projector

Note: For each projector only one Acuras Multi-point position can be defined.

Note: Make sure that the selected projector is available in the Head Location that you have selected.

- From the *Select Camera, Spectrometer and Laser* subsection select the following devices from the drop down lists
 - spectrometer
 - laser

8. Getting started

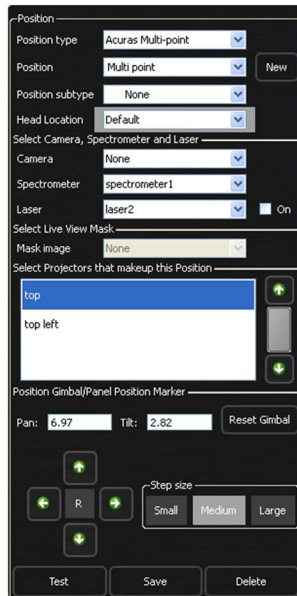


Image 8-42
Selecting spectrometer and laser

7. Press the **Panel Marker** button in the section *MP Acuras control* of the GUI.

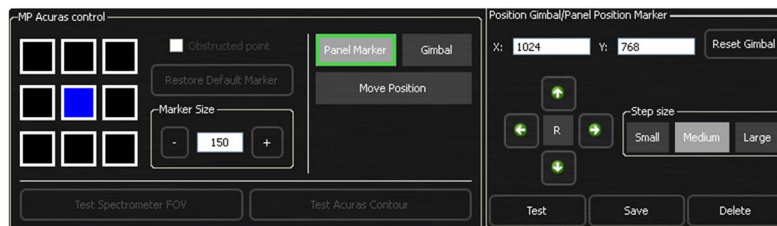


Image 8-43
Panel Marker Center is focused

Note: By default the **Panel Marker Center** is always focused.

Note: The labels **Pan** and **Tilt** in the section *Position Gimbal/Panel Position Marker* changes to **X** and **Y** respectively.

Note: Use the Marker size buttons **+** and **-** to increase or decrease the Panel Marker size, so as to compensate the distance between spectrometer and screen. The size adjustment of the Panel Markers 1-2 and 3-4 is disabled.

8. Optionally, set the focus to another **Panel Marker** in one of the following ways:

- by pressing another Panel Marker in the *Position subtype* drop down list;

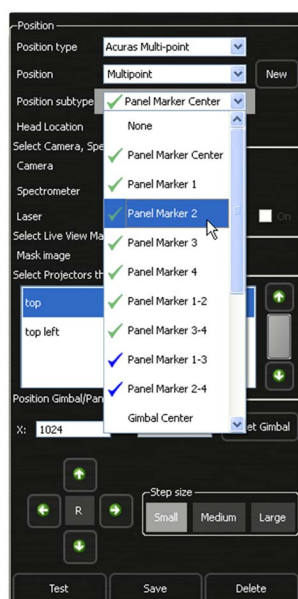


Image 8-44

Selection: Panel Marker 2 is focused

- or by pressing another square directly on the *MS Acuras position* section of the GUI;

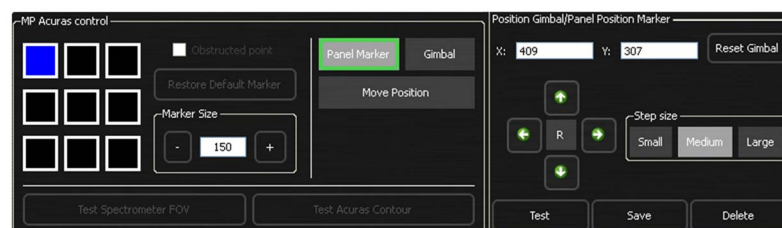


Image 8-45

Selection: Panel Marker 1 is focused

- or by scrolling to another one using the Gimbal control arrows on the GUI.

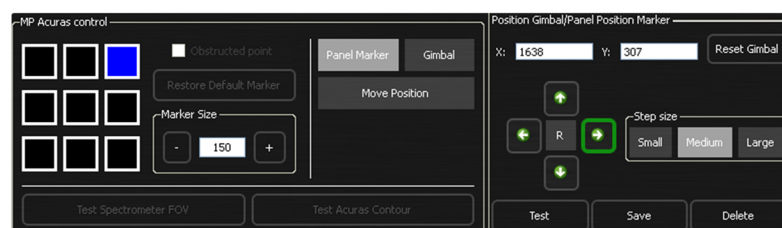


Image 8-46

Selection: Panel Marker 2 is focused

9. Press the button **Move Position** to select the focused Panel Marker

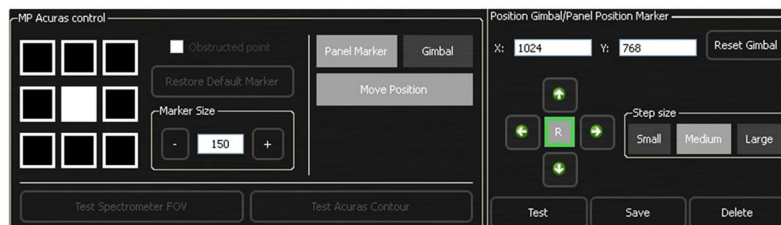


Image 8-47

Panel Marker Center: activated

Note: The blue background of the Panel Marker square on the projected image and on the user interface turns white.

10. Press the button **R** to transfer control to the navigation arrows on the eRACU hand held unit for the Panel Marker movements.

8. Getting started



Image 8-48
Transferring control to navigation buttons on the eRACU hand held unit

11. Use the Gimbal control arrows to move the selected Panel Marker to its correct position.

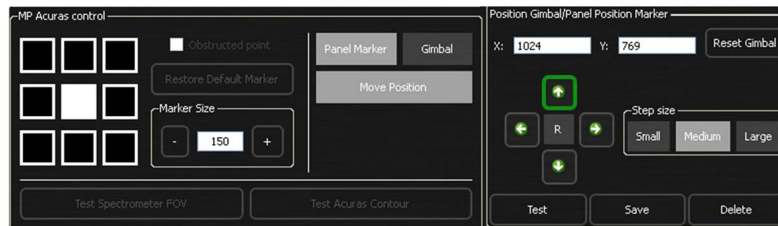


Image 8-49
Gimbal control arrows

Note: Use the **Step size** buttons to increase or decrease the adjustment steps of the Gimbal.

12. Press the button **Move Position** again to automatically store the actual Panel Marker position.

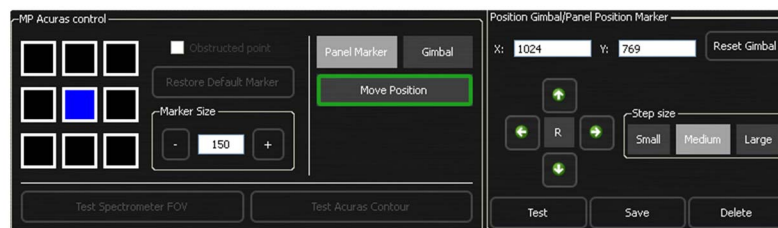


Image 8-50
Panel Marker Center: defined

13. Repeat steps 8 to 12 for the other Panel Markers whose position need to be corrected.

How to define the optional Panel Markers?

By default, the position of **Panel Markers 1–3 and 2–4** is automatically calculated (and valid), but can be changed. This is indicated by a blue check mark in the *Position subtype* drop down list. **This procedure applies to the pentagonal or hexagonal image.**

1. If desired, focus on **Panel Marker 1–3**.
2. Press the button **Move Position** to activate the **Panel Marker 1–3**.
3. Use the left and right Gimbal control arrows to move the Panel Marker to the edge of the visible image.

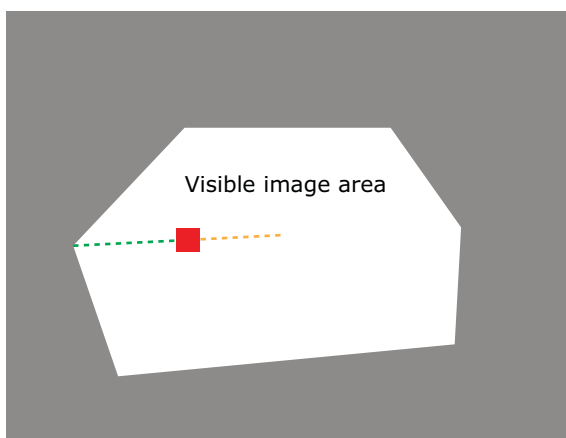


Image 8-51
Panel Marker 1–3: default position

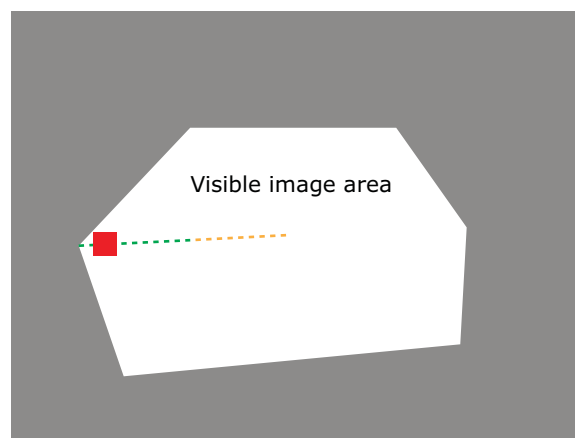


Image 8-52
Panel Marker 1–3: moved to its new position

Note: The line on which **Panel Marker 1–3** can be moved is indicated on the image by a dashed line, partly yellow and partly green (not visible on the projected image). Moving the Panel Marker to the yellow zone results in a higher rate of interpolation while performing the automatic brightness and color measurement. This can affect the uniformity of the color/brightness alignment.

- Press the button **Move Position** again to automatically save the corrected **Panel Marker 1–3** position.

A green check mark appearing in front of **Panel Marker 1–3** indicates that the default position of this Panel Marker has been changed and saved.

- Repeat this procedure for **Panel Marker 2–4**, if desired.

8.6.2.2.3 Defining the Gimbal positions



Gimbal position

An orientation (pan and tilt) of the Gimbal of the AutoAlignment Head. A Gimbal Marker links the spectrometer on-screen measurement to the according Panel Marker: its definition ensures that the spectrometer measures at the location indicated by its Panel Marker.

Introduction

In this procedure, we are going to point the laser dot to the center of each Panel Marker in turn. When pressing the **Gimbal** button in the *MP Acuras control* section, nine (or seven) red squares appear, each one at the center of a Panel Marker.

- a small red square on the projected image indicates a Panel Marker for which no Gimbal position is available
- a small green square on the projected image and a green check mark in the GUI indicate a Panel Marker for which a Gimbal position is available
- a focused Gimbal position is indicated by the small square having a blue outline on the projected image and a blue background on the GUI: this Gimbal position can be selected to be defined or the Gimbal arrows can be used to jump to another Gimbal position
- a selected Gimbal position is indicated by the small square having a white outline on the projected image and a white background on the GUI: the Gimbal control arrows can be used to move the laser dot to this position

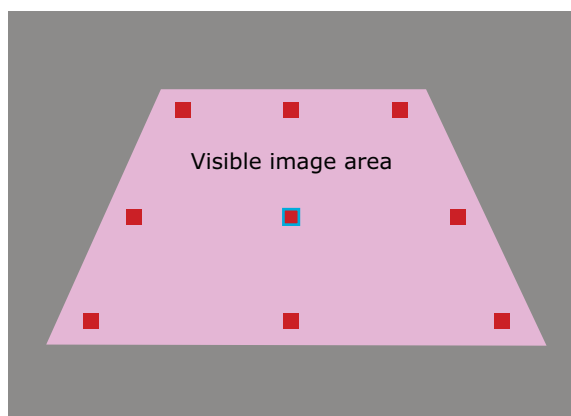


Image 8-53
Gimbal points: Gimbal Center is focused

How to define the Gimbal positions?

- Press the **Gimbal** button in the section *MP Acuras control* of the GUI.

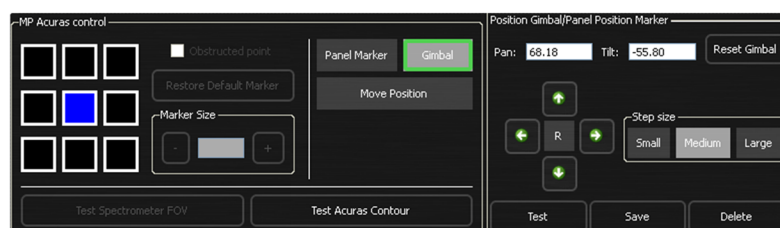


Image 8-54
Gimbal center is focused

By default the **Gimbal Center** is focused.

- Optionally, set the focus on another Gimbal position in one of the following ways:

8. Getting started

- by pressing another Gimbal position from the *Position subtype* drop down list;

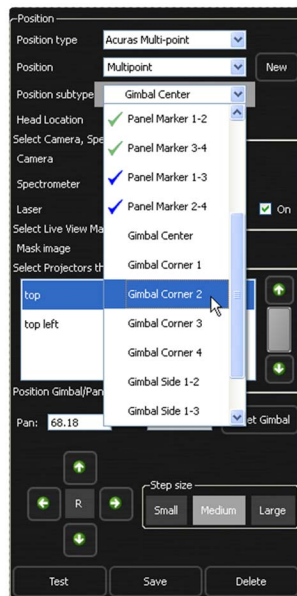


Image 8-55
Selection: Gimbal Corner 2 is selected

- or by pressing another square directly on the *MP Acuras position* section of the GUI;

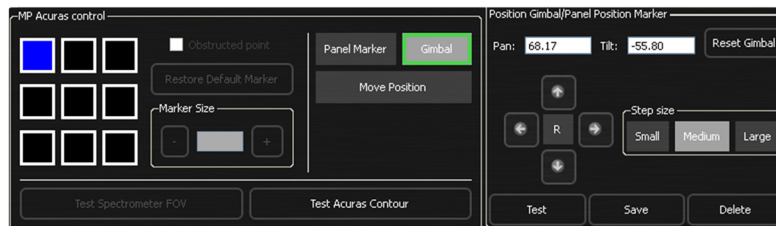


Image 8-56
Selection: Gimbal Corner 1 is focused

- or by jumping to another Gimbal position using the Gimbal control arrows on the GUI.

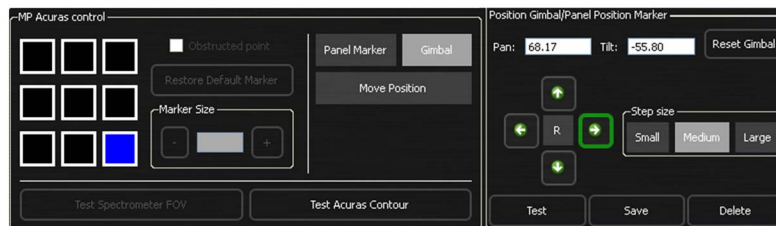


Image 8-57
Selection: Gimbal Corner 4 is focused

Automatically the *Laser* is switched ON.

3. Press the button **Move Position** to select the focused Gimbal position

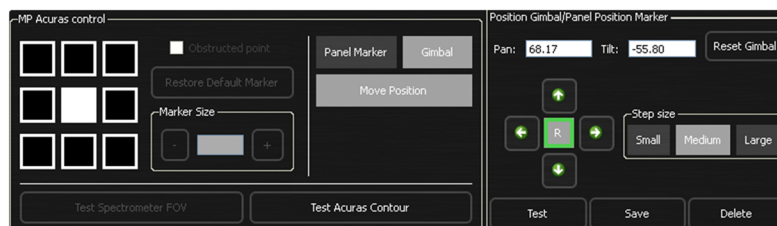


Image 8-58
Gimbal Center is activated

Note: The selected Gimbal position is indicated by a white background on the GUI and a white outline on the small square on the projected image.

4. Press the button **R** to transfer the control to the navigation arrows on the eRACU hand held unit for the Gimbal movements.



Image 8-59
Transferring control to navigation buttons on the eRACU hand held unit

5. Use the Gimbal control arrows to direct the laser beam to the center of the selected red square on the projected image.

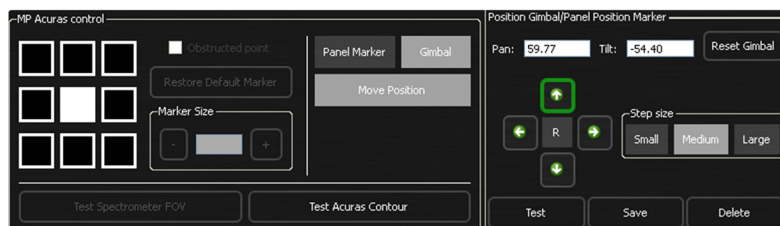


Image 8-60
Gimbal control arrows

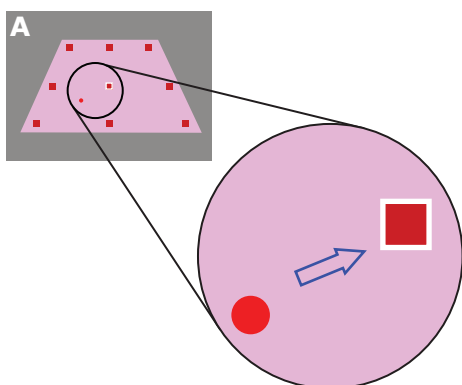


Image 8-61
A Laser beam: at a random position

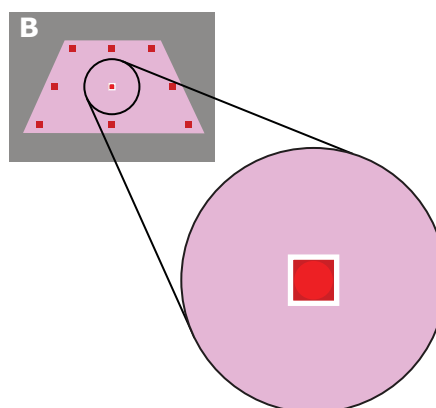


Image 8-62
B Laser beam: at the center of the red square

Note: Use the **Step size** buttons to increase or decrease the adjustment steps of the Gimbal.

6. Press the button **Move Position** again to store the Gimbal orientation (pan and tilt) along with the Panel Marker position.

8. Getting started

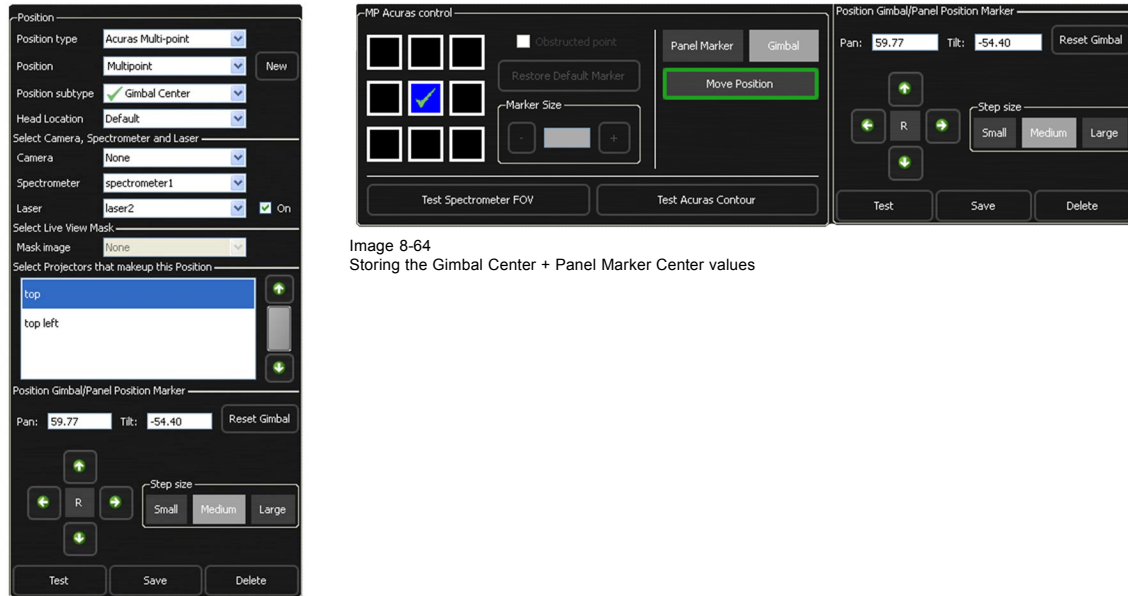


Image 8-64
Storing the Gimbal Center + Panel Marker Center values

Image 8-63
Storing the Gimbal Center + Panel Marker Center values

Note: A green check mark appears in the corresponding square in the section MP Acuras Control and in front of the **Gimbal** indicating that the value have been stored.

The red square of that Gimbal position on the projected image turns green and focused.

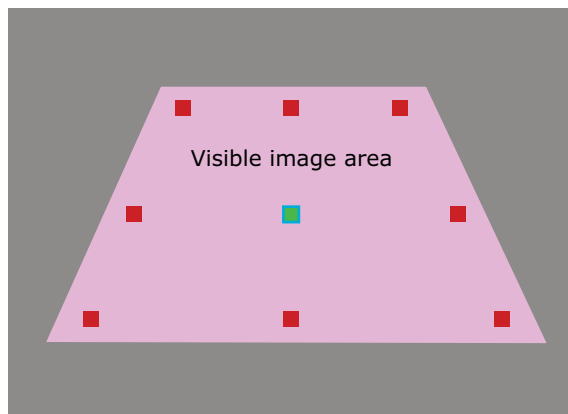


Image 8-65
Gimbal Center: green square

7. Repeat the steps 2 to 6 for all Gimbal positions.

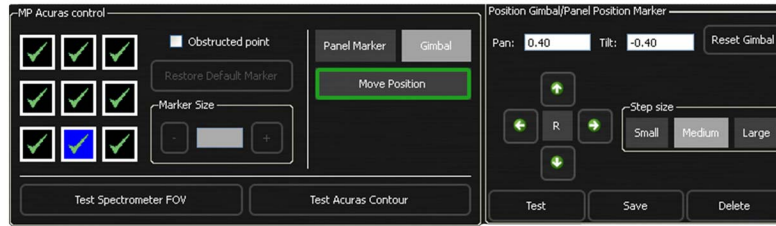
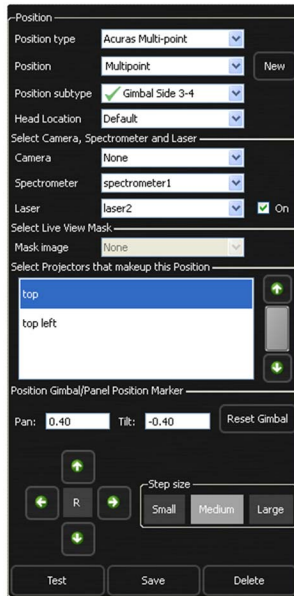


Image 8-67
Gimbal side 3-4 + Panel Marker 3-4 values stored

Image 8-66
Gimbal side 3-4 + Panel Marker 3-4 values stored

8. Press the **Save** button.

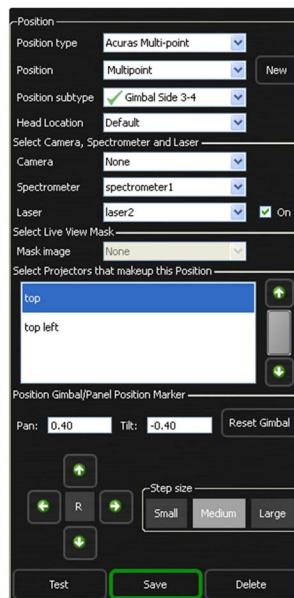


Image 8-68
Save: button

Caution: Make sure that the Gimbal position is defined for each Panel Marker prior to saving an Acuras Multi-point position. Otherwise, the following alert dialog appears if attempted to save an incomplete Acuras Multi-point position.

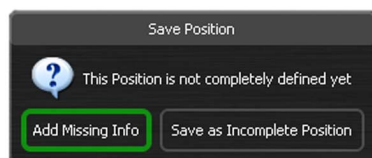


Image 8-69

9. In the appearing *Status information* dialog, press **OK** to save the new Acuras Multi-point position or modified selected position.

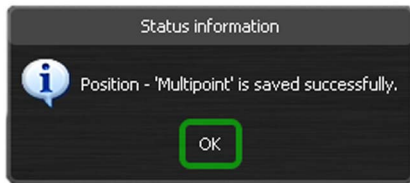


Image 8-70
Saving the new Acuras Multi-Point

The Panel Marker positions and Gimbal positions are now saved along with the selected projector, spectrometer, laser and head location.

Obstructed point

If the laser dot can not be pointed to one of the side Panel Markers because of a mechanical obstruction (e.g. cockpit, metal beam), the according Gimbal position can be set as **Obstructed point**, by checking the concerning check box. This Gimbal position is then marked with a 'no entrance' sign on the projected image and on the GUI. Only one of the side Panel Markers can be set as an Obstructed point.



Position Subtypes which are already stored can be verified by selecting them. The appropriate Panel Marker is then indicated on screen and the Gimbal points to it.



If an existing Panel Marker is changed, it will be required to redefine one or more Gimbal positions.



Changes to Panel Markers and/or Gimbal positions of an existing Acuras Multi-point position are only saved after pressing the Save button.



Make sure that all Gimbal positions for a single display channel is defined from a single physical head location. Also ensure that this physical head location is present and corresponds to the AutoAlignment Head location selected on the Position page.

Changing this physical head location or selecting a different AutoAlignment Head location on the Position page will require the user to re-define all Gimbal positions.

8.6.3 AutoGeometry position: Faceted display



AutoGeometry: Faceted display

The goal of AutoGeometry is to determine the position of the screen corners in relation to the panel of the corresponding projector (X and Y projector pixel coordinates), where deviations between the captured and realigned state are returned to the Image Generator in order to make corrections

Overview

- Difference between AutoGeometry faceted and warp display
- Defining AutoGeometry position: standard channels
- Defining AutoGeometry position: Head-Up Display
- Creating Mask image

8.6.3.1 Difference between AutoGeometry faceted and warp display



IG

Image Generator

Differences

The table below list the differences between the AutoGeometry faceted and warp display and also indicated which one is to be selected when.

AutoGeometry faceted display	AutoGeometry warp display
mostly used for rear projection flat faceted display	mostly used for rear projection curved screen
when user want warping to be done on IG instead of the projector	when warping can be done on the projector



Selecting projector warping is best option, where warping done on the IG is not sufficient.

8.6.3.2 Defining AutoGeometry position: standard channels

Introduction

AutoGeometry is used to calculate the X and Y projector pixel coordinates of the required image corners of each channel in a display system. This can be done by aiming your AutoAlignment Head camera to the required corner(s). For this purpose, AutoGeometry positions must be defined to learn XDS RACU where to look for the corners.

Choose AutoGeometry position subtype **Without Blend Zone** if there is no overlap between channels or choose **With Blend Zone** if there is overlap between channels.



It is good practice to include as much corners as possible in one position, however this depends upon the channel size in the display. Both multiple corners of a single channel or corners of different channels are allowed within a single AutoGeometry position.



Mechanically blocked the overshoot or stray light coming from one channel into the other channel.



AutoGeometry requires full colored test patterns. Remove any color filters from the projector light path during execution of AutoGeometry, including from the Head-Up Display.



A Head-up Display is not considered as a standard channel.

Measuring corners in single channel setup

Consider a display system where you have a projected image consisting of one single channel. In this case four corners in total need to be included in the set of positions to be defined.

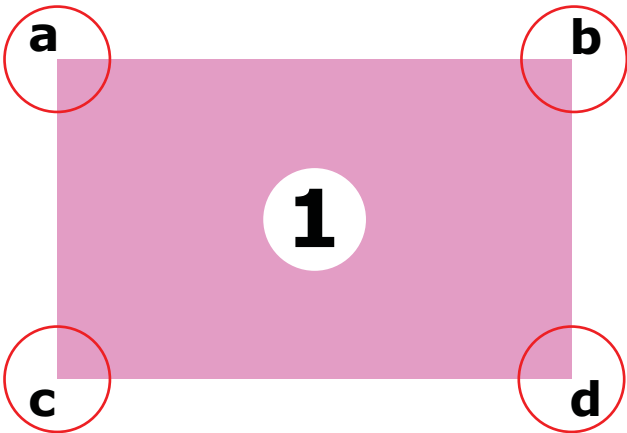


Image 8-71
Example: Single channel setup (Without Blend Zone)

a to d	corners of channel 1
--------	----------------------

Measuring corners in multi-channel setup

Without Blend Zone

Consider a display system where you have a projected image consisting of two non-overlapping channels. In this case eight corners in total need to be included in the set of positions to be defined. At the corners where two channels are meeting each other, both corners may be included in one single position.

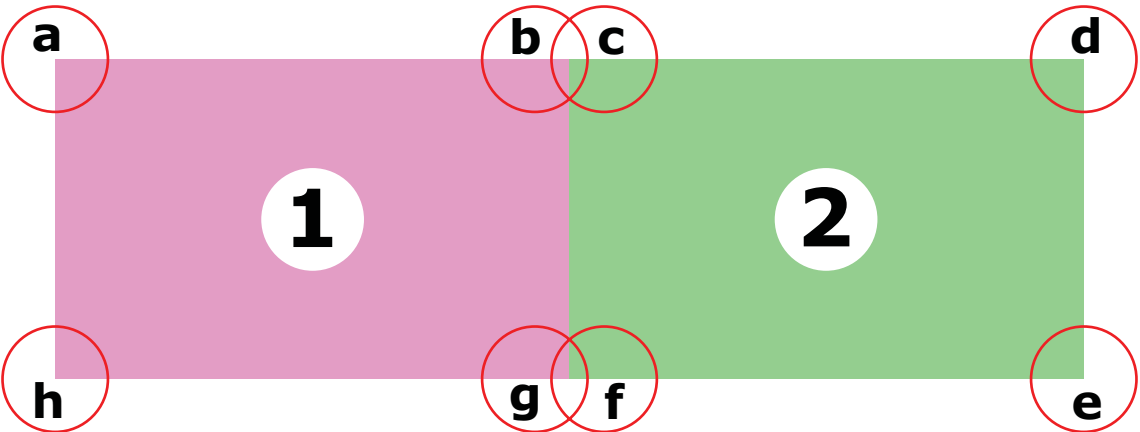


Image 8-72
Example: Multiple channels setup (Without Blend Zone)

1	channel 1
2	channel 2
a, b, g, h	corners of channel 1
c, d, e, f	corners of channel 2

With Blend Zone

Consider a display system where you have a projected image consisting of two overlapping channels. In this case eight corners in total need to be included in the set of positions to be defined. Also here, the common corners will be included in one single position. Of course it is possible to include more than two projector corners of the same channel in a single position if they are not too far away from each other.

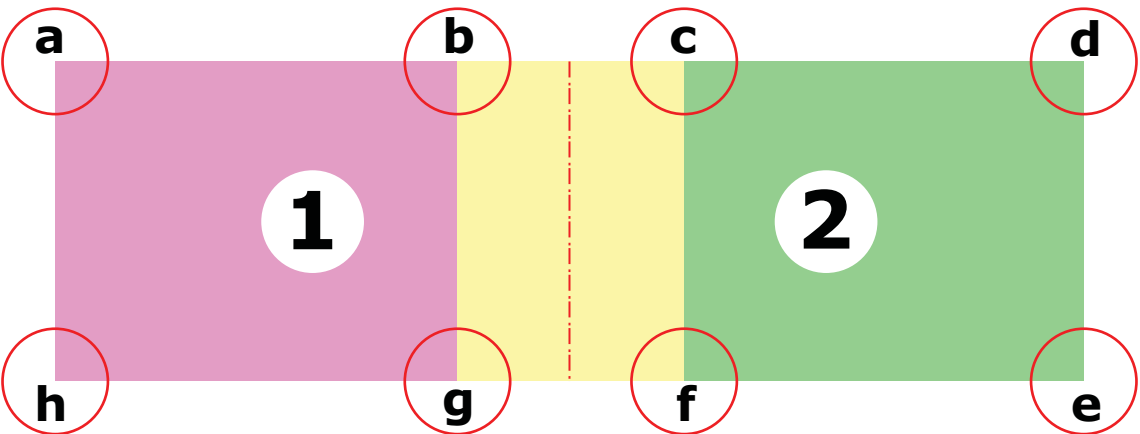


Image 8-73
Example: Multiple channels setup (With Blend Zone)

1	channel 1
2	channel 2
a, c, f, h	corners of channel 1
b, d, e, g	corners of channel 2



CAUTION: Corners in Electrical Soft-Edge Matching zones only are allowed. Corners in Optical Blend zones are not supported.



The shape of the visible channel area can be more general than the rectangular examples above.



While defining the AutoGeometry positions, you can use both Position subtype With Blend Zone or Without Blend Zone depending on corner types in that position. If the defined position has both overlapping and non overlapping corners, you must select Position subtype With Blend Zone.



Auto Exposure

Auto Exposure is an optimization of the camera integration time. If that time is too low, the scene is too dark and not visible. If it is too high, the scene will be saturated and not clear.

How to define AutoGeometry positions for standard channels?

1. Project any image or internal pattern from the projector(s) for the desired AutoGeometry position.
2. On the Positioning Page, navigate to Position > Position type and select **AutoGeometry** from the drop down list.

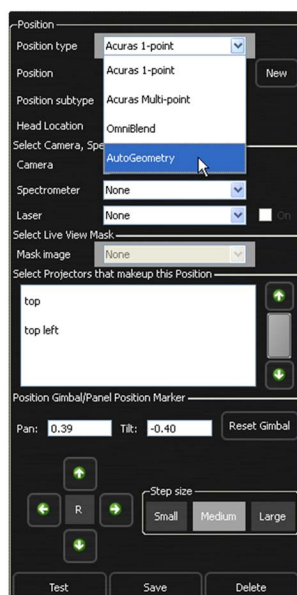


Image 8-74
Position type: AutoGeometry

3. From the *Select Camera, Spectrometer and Laser* subsection select Camera from the drop down lists.

8. Getting started

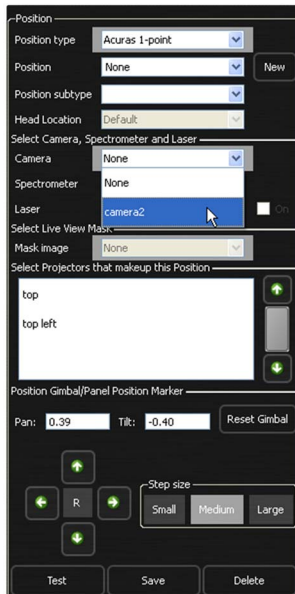


Image 8-75
Selecting camera

4. Press the **Start live view** button to see live view of the projected image from the selected camera.

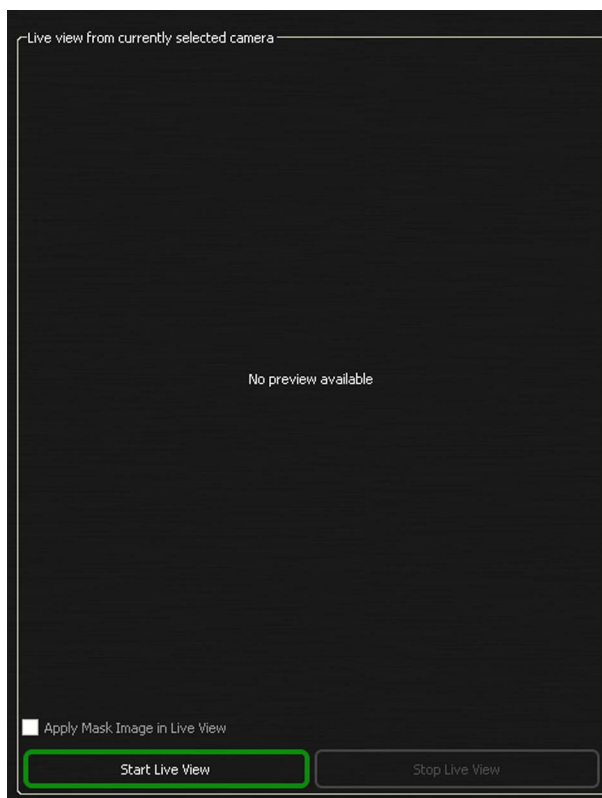


Image 8-76
Starting the live view

Note: Auto Exposure might take some seconds to complete, wait until it is completed.

5. Press the **New** button to define a new position or select an existing position from Position drop down list to change it. For a new position, a name must be entered in the Position edit box.



Image 8-77
Creating a new position

Note: Selecting an existing position will highlight the selected projector(s) used in this position and causes the Gimbal to move to the stored orientation for that position.

Note: Use the **Delete** button to delete an existing position, if required. All Auto Geometry data belonging to this position will be deleted.

6. Select the correct AutoAlignment Head location from the *Head Location* drop down list.



Image 8-78
Head Location: Default

7. Use the Gimbal control arrows to move the Gimbal until the Camera Live view shows the Position as it is desired.

8. Getting started

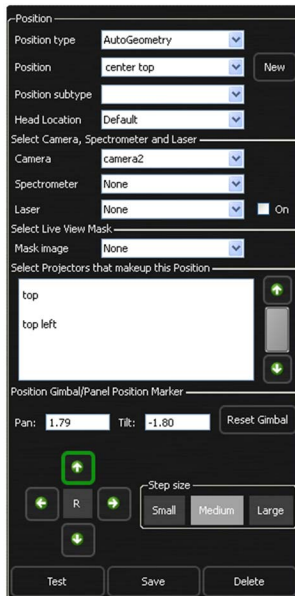


Image 8-79
Gimbal control arrows

Note: A good practice is to bring as many corners inside the camera live view.

Note: Make sure that the channel corners are not too close to the edges of the Camera Live view. In practice, they should not be within the outer 15% border of the camera live view. Also ensure a sufficient portion of each channel is visible in the camera field of view.

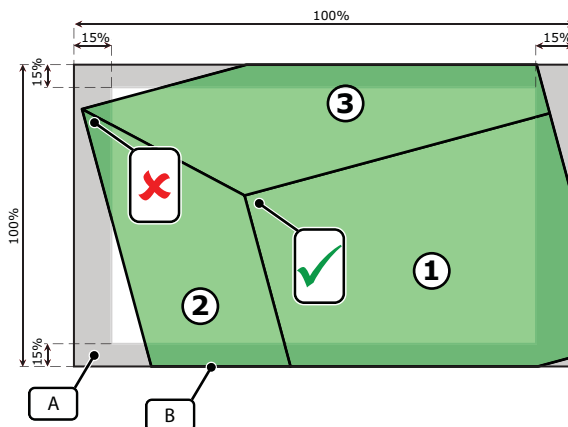


Image 8-80
Bad example: one of the channel corners are not within 15% of camera live view

A 15% border of the Camera Live view
B Camera Live view

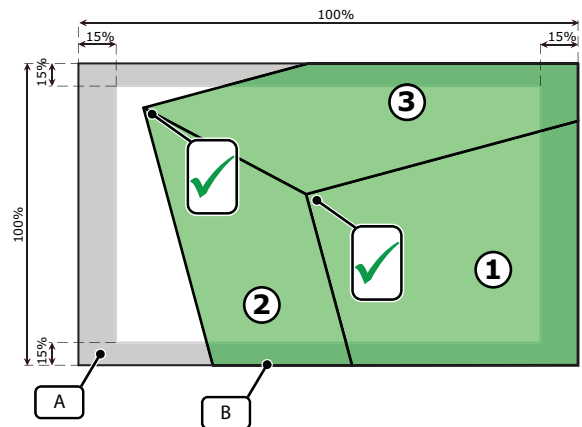


Image 8-81
Good example: channels corners within 15% of camera live view

A 15% border of the Camera Live view
B Camera Live view

Note: Use the **Step size** buttons to increase or decrease the adjustment steps of the Gimbal.

Note: Press the **R** button to control the Gimbal movements using the navigation buttons on the eRACU hand held unit.

8. Select **Without Blend Zone** or **With Blend Zone** from the *Position subtype* drop down list.



Image 8-82

Position subtype: Without Blend Zone

Note: Select **Without Blend Zone** if there is no overlap between channels.

Select **With Blend Zone** if at least one corner of the current position is in an overlap zone.

9. From the *Select Projectors that makeup this Position* section, select the projector(s) of which at least one channel corner is meant to be included in the selected position.

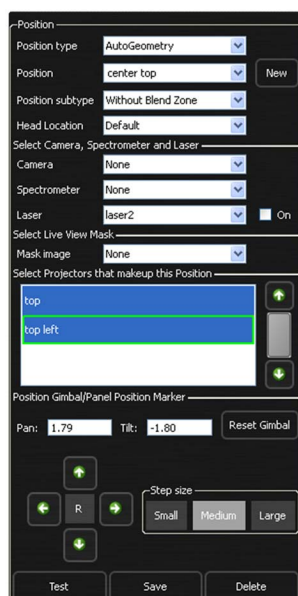


Image 8-83

Selecting the projector(s)

Note: Make sure that each selected projector is visible from the Head Location that you have selected.

10. Optional: If unwanted objects (artifacts) are visible in the current Camera Live view, they must be masked. Select a suitable mask from the Mask Image drop down list. See "Creating Mask image", page 89.

8. Getting started

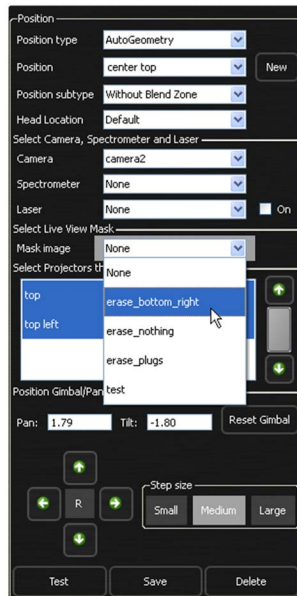


Image 8-84
Selecting a suitable mask

Automatically, the check box Apply Mask Image in Live View gets enabled (see the image below). Use it to toggle On/Off mask.

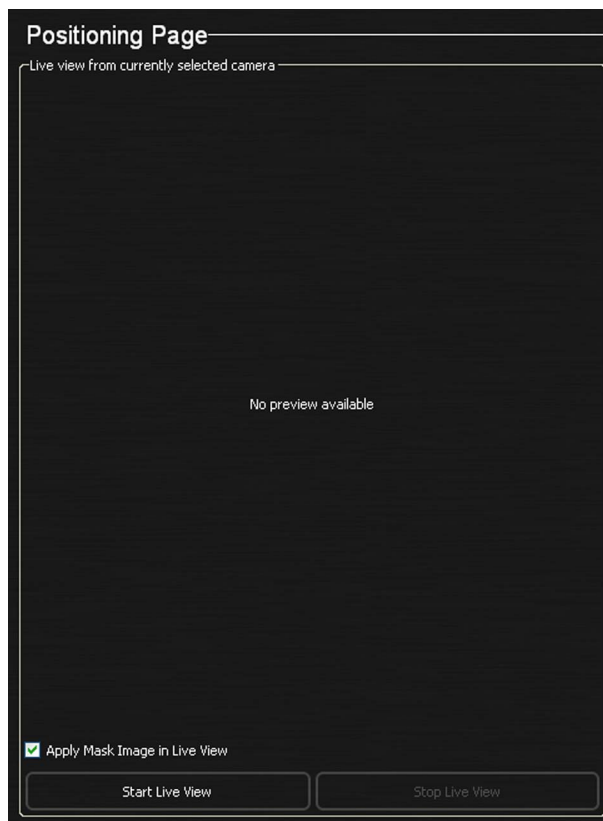


Image 8-85
Masking enabled

11. Press the **Save** button.



Image 8-86
Saving new position: center top

If a different AutoAlignment Head location is selected, then you will be prompted to physically position the AutoAlignment Head at the location as indicated in the *Alert* dialog.

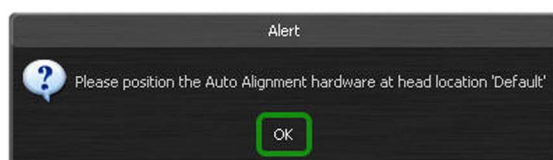


Image 8-87
Alert dialog

12. In the appearing —OK to save this position or to modified selected position.

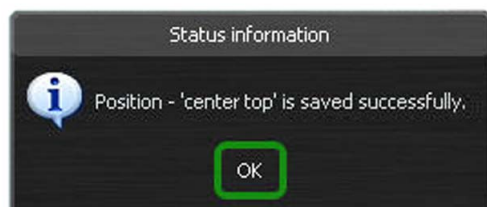


Image 8-88
Position center top saved successfully

13. Repeat steps 5 to 12 to create additional positions until all remaining channel corners are part of at least one position.

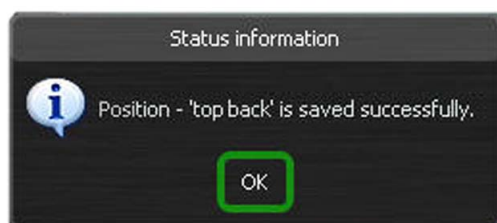


Image 8-89
Position top back saved successfully

8.6.3.3 Defining AutoGeometry position: Head-Up Display



HUD

Head Up Display

Introduction

In case of AutoGeometry position subtype: Head-Up Display (HUD), the four corners of the region of interest of the HUD image need to be measured. These corners can appear on one single channel or on multiple channels. This requires the user to identify the corners of the HUD in relation to the background channels on which they are projected.

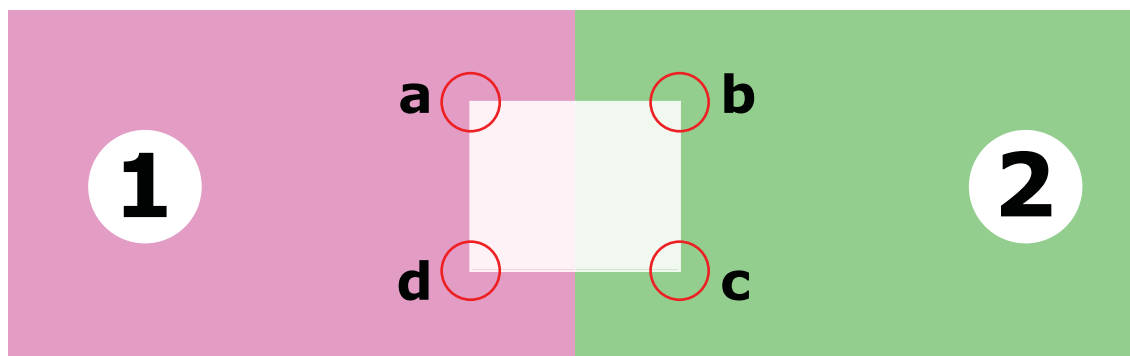


Image 8-90
Example: HUD corners in multiple channel setup

1	channel 1
2	channel 2
a, b, c, d	HUD corners

How to define the AutoGeometry position for HUD image?

- Project any image or pattern from the projectors for the desired AutoGeometry position subtype: HUD
Note: The projectors include the HUD projector and projectors on whose projected image the HUD image corners are appearing.
- On the Positioning Page, navigate to Position > Position type and select **AutoGeometry** from the drop down list. See image 8-74
- From the *Select Camera, Spectrometer and Laser* subsection select Camera from the drop down lists. See image 8-75
- Press the **Start live view** button to see live view of the projected image from the selected camera. See image 8-76
Note: Auto Exposure might take some seconds to complete, wait until it is completed.
- Press the **New** button to define a new position or select an existing position from Position drop down list to change it. For a new position, a name must be entered in the Position edit box. See image 8-77
 You will be prompted to physically position the AutoAlignment Head at the correct location. See image 8-87
Note: Selecting an existing position will highlight the selected projector(s) used in this position and causes the Gimbal to move to the stored orientation for that position.
Note: Use the **Delete** button to delete an existing position, if required. All Auto Geometry data belonging to this position will be deleted.
- Select **HUD** from the *Position subtype* drop down list.

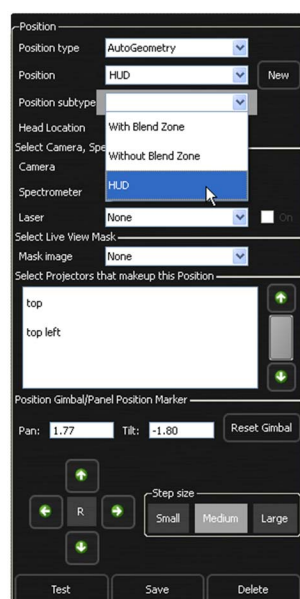


Image 8-91
Position subtype: HUD

7. Select the correct AutoAlignment Head location from the *Head Location* drop down list.



Image 8-92

Head Location: Default

Note: If different AutoAlignment Head location is selected, then you will be prompted again to physically position the AutoAlignment Head at the location as indicated in the drop down list.

8. Use the Gimbal control arrows to move the Gimbal until the Camera Live view shows the position as it is desired.



Image 8-93

Gimbal control arrows

Note: Use the **Step size** buttons to increase or decrease the adjustment steps of the Gimbal.

Note: Press the **R** button to control the Gimbal movements using the navigation buttons on the eRACU hand held unit.

9. From the *Select Projectors that makeup this Position* section, select a projector on whose projected image one or more HUD image corners are appearing that to be included in the defined position.

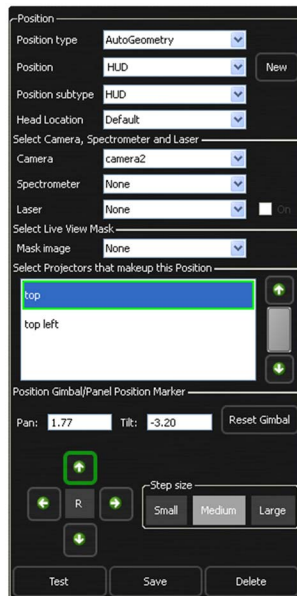


Image 8-94
Selecting a projector

Note: Make sure that the selected projector is visible from the Head Location that you have selected.

10. Optional: If unwanted objects (artifacts) are visible in the current Camera Live view, they must be masked. Select a suitable mask from the **Mask Image** drop down list. See "Creating Mask image", page 89.



Image 8-95
Selecting a suitable mask

11. Press the **Save** button



Image 8-96
Saving the HUD position

A *Status Information* dialog will appear, click **OK** to save the new HUD position or the modified selected HUD position.

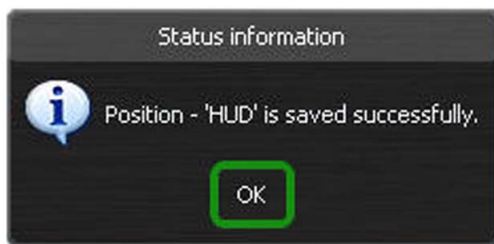


Image 8-97
Position HUD saved successfully

12.Repeat steps 5 to 11 to create additional positions if there are any remaining HUD image corners.

8.6.3.4 Creating Mask image

Introduction

While defining the AutoGeometry positions sometimes unwanted objects (e.g. mechanical object, fake corner(s), etc...) are visible in the Camera Live view of that position. Those artifacts must be hidden as the AutoGeometry algorithm may detect them wrongly as channel corners. This requires the user to create a mask using any design program: e.g. *MS Paint*, *Adobe Photoshop*, *Gimp*, *Paint.NET*.

The mask image resolution should be a little bigger than half of the camera resolution:

- Canon EOS 1000D: 1953 x 1301 pixels;
- Canon EOS 1100D: 2176 x 1437 pixels.

It must contain only black and white regions. A black region is used to hide the artifacts and the white regions of the mask will not hide the image. All mask files must be saved as .png files at the following location on the MCU: <C:\Program Files\Barco\XDS\resources\autoalign\maskImages>

In case of XDS RACU Diskless server, all mask files must be saved on a storage server provide by the customer at the following location: \\<MCU hostname>\shared_folder\<MAC address>\autoalign\maskImages where <MCU hostname> is the diskless MCU server name, shared_folder is a folder on the diskless server and <MAC address> is the MAC address of diskless MCU server.

To know the MAC address of your MCU connected over the network, you may need to follow the steps mentioned below

1. Go to *Start > Connect to > All Connections*
2. Select your Local Area Connections right click it and select Status
3. In the Local Area Connection Status, select Support tab and click Details
4. The MAC address is the Physical Address listed in Network Connection Details.

Examples:



Image 8-98
Example 01: hide_bottom_right.png



Image 8-99
Example 02: hide_support_right_left_plug.png

8.6.4 AutoGeometry position: Warp display

8.6.4.1 Difference between AutoGeometry faceted and warp display



IG
Image Generator

Differences

The table below list the differences between the AutoGeometry faceted and warp display and also indicates which feature is to be selected and when.

AutoGeometry faceted display	AutoGeometry warp display
mostly used for rear projection flat faceted display	mostly used for rear projection curved screen
when user want warping to be done on IG instead of the projector	when warping can be done on the projector



Selecting projector warping is best option, where warping done on the IG is not sufficient.

8.6.4.2 Defining the AutoGeometry position

Introduction

AutoGeometry position can be defined by aiming your AutoAlignment Head camera to the desired position on the screen so that a desired amount of projector's warp image is visible inside the Camera Live View on the Position page.

AutoGeometry warp position saves the Gimbal orientation (pan and tilt) along with the camera ID, and the projectors used in defining the position. This information is later used by the XDS RACU system for the AutoGeometry warp capture and realignment process.

How to define the AutoGeometry position?

1. Manually adjust the warp of the projector(s) (**only if necessary and required !**) in a group so that a geometrically seamless image appears across the projectors on the screen.
Tip: Use the XDS RACU Geometry page or the projector's OSD or SimCAD to adjust the warp of the projector's.
2. Navigate to the Eyepoint page and save this geometry setting as an eyepoint file.
3. Project any image or internal pattern from the projector(s) for the desired AutoGeometry warp position.
4. Navigate to the following pages of the XDS RACU GUI and do the following:

- Navigate to *Options > AutoGeometry > Warp AutoGeometry* and check *Enable Warp AutoGeometry* check box;

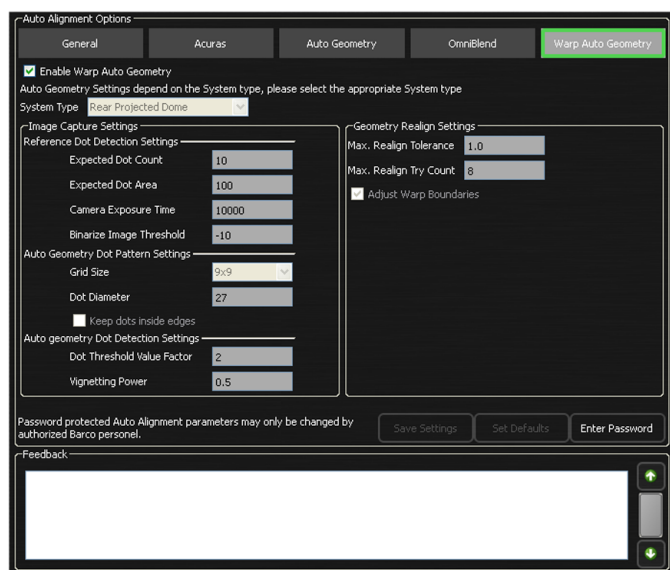


Image 8-100
Enabling the Warp AutoGeometry

- Navigate to *Power Switch* page and switch ON the concerned LDAT device(s).

5. In the *Positioning Page* navigate to *Position > Position type* and select **AutoGeometry** from the drop down list.



Image 8-101
Selecting the AutoGeometry position

6. From the *Select Camera, Spectrometer and Laser* section select the Camera to be used from the drop down lists.

8. Getting started

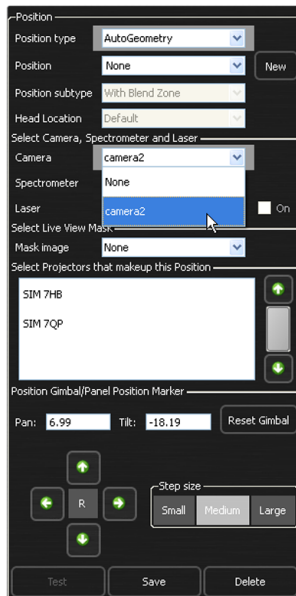


Image 8-102
Selecting the camera

7. Press **Start Live View** to see live view of the projected image from the selected camera.

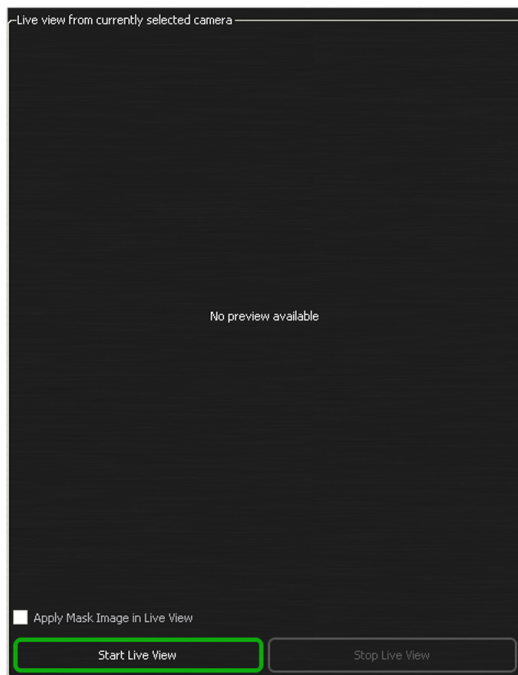


Image 8-103
Starting the camera live view

Note: Auto Exposure might take some seconds to complete, wait until it is completed.

8. Press **New** to define a new position or select an existing position from Position drop down list to change it.
For a new position, a name must be entered in the Position edit box.



Image 8-104
Creating a new position

Note: Selecting an existing position will highlight the selected projector(s) used in this position and causes the Gimbal to move to the stored orientation for that position.

Note: Press **Delete** to delete an existing position, if required. All AutoGeometry data belonging to this position will be deleted.

9. Select the AutoAlignment Head "Default" location from the Head Location drop down list.



Image 8-105
Selecting the AutoAlignment Head location "Default"

Note: By the time of the release of this manual, only one AutoAlignment Head (i.e. Default) location head location is allowed for all positions to be defined for a single AutoGeometry warp position.

10. Use the Gimbal control arrows to move the Gimbal until the Camera Live view shows the Position as it is desired.

8. Getting started

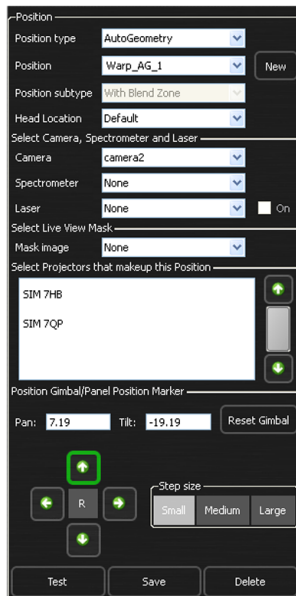


Image 8-106
Gimbal control arrows

Caution: Make sure that at least one quadrilateral image (approximately, formed by the LDAT's laser dots) is appearing inside the Camera Live view of every Position to be saved. A Position not having any single quadrilateral image appearing on it is invalid.

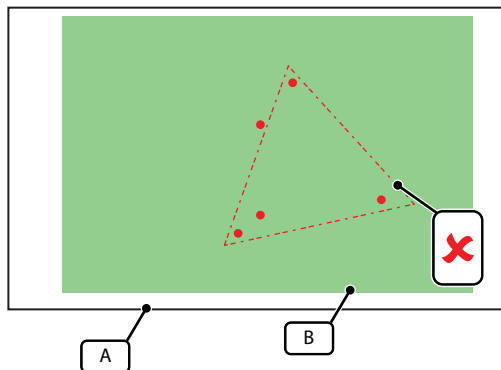


Image 8-107
Bad example: No quadrilateral image on the position

A Camera Live View
B Position to be saved

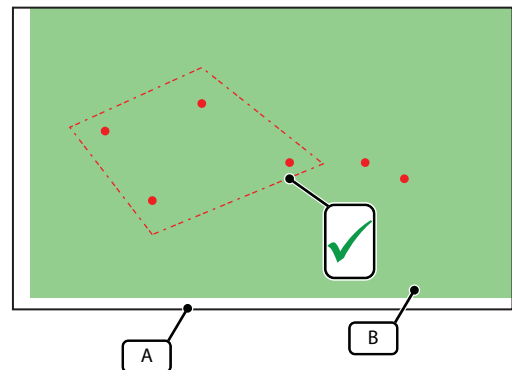


Image 8-108
Good example: One quadrilateral image on the position

A Camera Live View
B Position to be saved

Note: A good practice is to bring as much area of the Position as possible inside the camera live view.

Note: Use the Step size buttons to increase or decrease the adjustment steps of the Gimbal.

Note: Press R to control the Gimbal movements using the navigation buttons on the eRACU hand held unit.

11. From the *Select Projectors that makeup this Position* section, select the projector(s) to be included in the selected position.

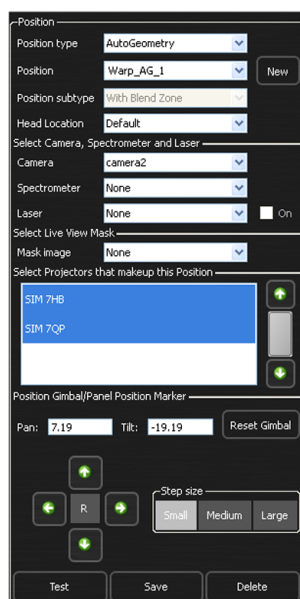


Image 8-109
Selecting the projector(s)

12. Press **Save** to save this position.

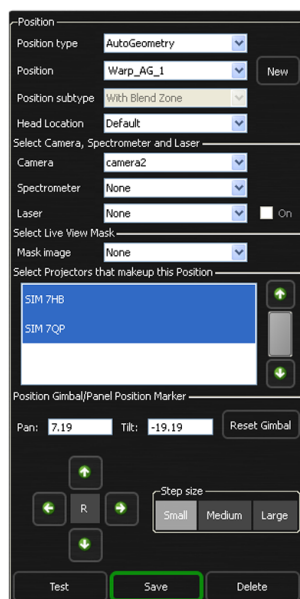


Image 8-110
Saving the new position

An **Alert** dialog appears to ask the user to verify the AutoAlignment Head location. If at the correct location press Yes to continue. If not at the correct location, then you need to physically position the AutoAlignment Head to the correct location and start the procedure from step 5 once again.



Image 8-111
Alert dialog

13. In the appearing **Status Information** dialog, press **Yes** to save this position or to modified selected position.

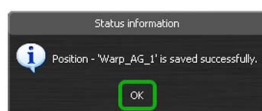


Image 8-112
Desired position saved successfully

14. Repeat steps 8 to 13 to create additional positions until every pixels of every projector are part of atleast one position.



Image 8-113
Desired position saved successfully

8.6.5 OmniBlend position

Overview

- OmniBlend position explained
- Defining OmniBlend position
- Creating Mask image

8.6.5.1 OmniBlend position explained



OmniBlend

OmniBlend is a dedicated optical blending alignment tool for visual display systems with overlapping channels. It optically scans blended edges and smoothenes out imperfections in blend regions. The OmniBlend function of XDS RACU uses the camera to keep the track of the blend regions and to automatically adjust the overlap (blend) region luminance and color of each projector, so that a seamless image results.



Auto Exposure

Auto Exposure is an optimization of the camera integration time. If that time is too low, the scene is too dark and not visible. If it is too high, the scene will be saturated and not clear.



The semi-circular dome display system and the shape of the visible channel areas as shown in the images below is just an example which has been created for better and clear understanding. OmniBlend however is not limited to visual display systems as represented in the images.

OmniBlend position

During configuration of the OmniBlend feature, each of the blend regions must be fully linked to its corresponding projector and to a camera orientation (head and pitch) from which it can be captured.

Each of the blend regions must be captured in at least one "Picture", a "Picture" being the Camera Live View for one fixed camera orientation (head and pitch). This "Picture" should not only include a blend region, but also at least some part of the adjacent non-blending areas. If a blend region does not fit in one "Picture", it can be captured in multiple "Pictures", each of them overlapping the adjacent one in part.

An OmniBlend position is the camera orientation (head and pitch) linked to a "Picture", but in this manual also refers to this "Picture" itself or to its corresponding Camera Live View.

OmniBlend positions should be carefully contrived, according to the following conditions and restrictions:

- The sum of all OmniBlend positions must include all blend regions of the canvas in full and at least once;
- One blend region may be captured in multiple overlapping OmniBlend positions if it doesn't fit one single OmniBlend position (image 8-114). The best alignment results are achieved if the overlap size of the OmniBlend positions is approximately the same size as the blend width;
- For each blend region that is part of an OmniBlend position, some part of the adjacent non-blend regions must be captured as well (image 8-115);
- A blend region should not lay next to the edges of an OmniBlend position (since the non-blend area at that side would then not be covered by this OmniBlend position – see previous bullet in this list). If one blend region lays next to the Position edge anyway, it should also be included in another OmniBlend position where it is more centralized;
- An OmniBlend position should only include small areas beyond the display screen: there is no point in selecting OmniBlend positions that only cover a small area of the screen and a big area next to the screen (image 8-116);
- In order to reduce the calculation time, the amount of OmniBlend positions should be kept to a minimum.

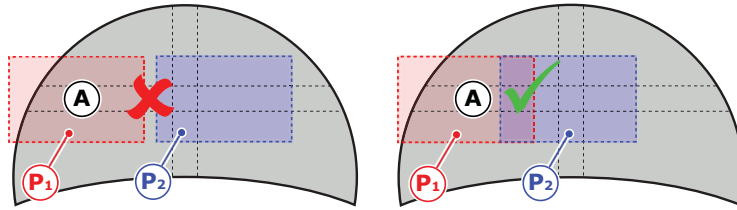


Image 8-114
OmniBlend position: overlapping positions

A Blend region
P1..2 OmniBlend positions

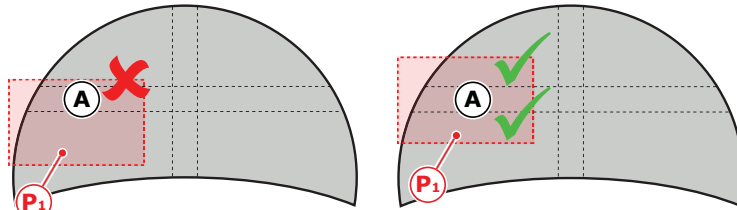


Image 8-115
OmniBlend position: includes some non-blend area

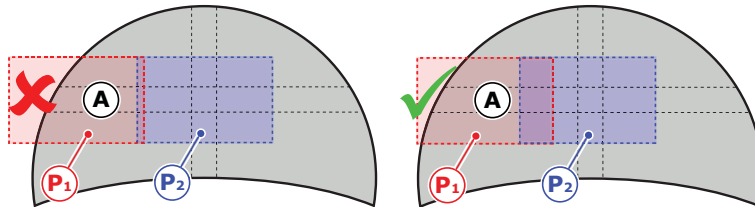


Image 8-116
OmniBlend position: must cover screen area

Example

Consider a four channel semi-circular dome display system with overlapping channels where it is not possible to fully capture all blend regions in one single OmniBlend position.

The combined blend region of all four channels (label **A** in the image below) can be captured in an OmniBlend position, but since the non-blend areas next to it should also be part of that position (see conditions above), it should be in or near the center of that position. This results in a position as illustrated by dotted red line in image 8-117.

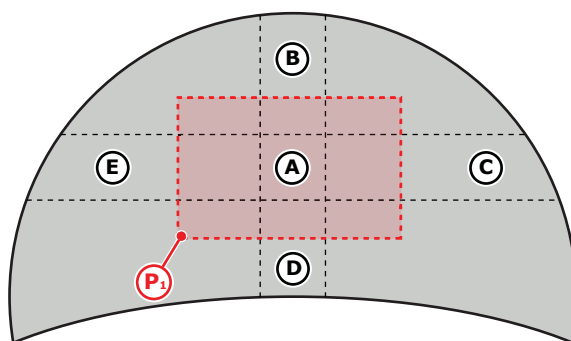


Image 8-117
OmniBlend position: good positioning

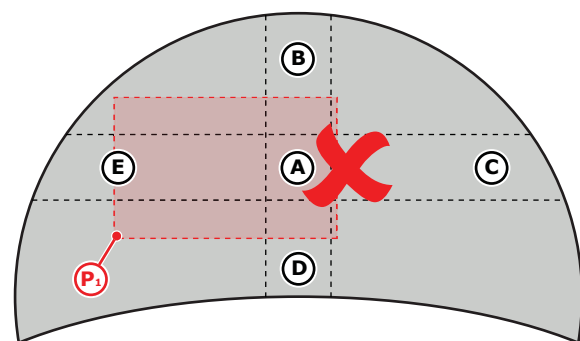


Image 8-118
OmniBlend position: bad positioning

A .. Blend regions
E .. Blend regions
P1 OmniBlend position 1

To capture the remaining area of the blend regions of this example (labels **B**, **C**, **D** and **E** in image 8-117), four more slightly overlapping OmniBlend positions are required (labels **P2**, **P3**, **P4** and **P5** in image 8-120).

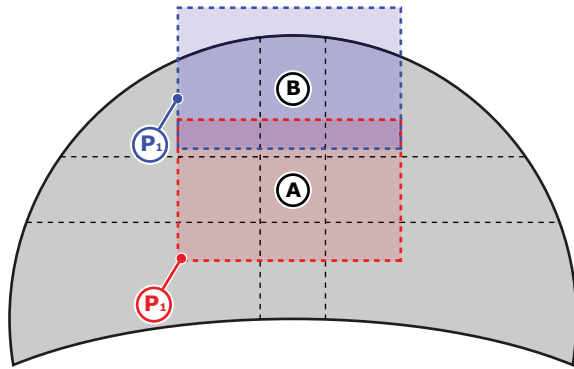


Image 8-119
OmniBlend position: overlap region A and B defined

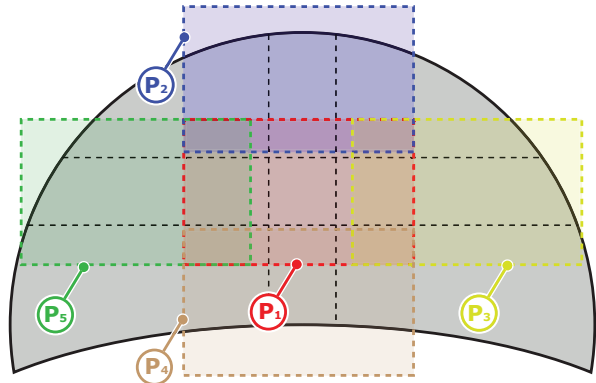


Image 8-120
OmniBlend position: all blend regions defined

8.6.5.2 Defining OmniBlend position

How to define the OmniBlend positions?

1. On the *Positioning* page, navigate to *Position > Position type* and select **OmniBlend** from the drop down list.



Image 8-121
Selecting OmniBlend

2. From the *Select Camera, Spectrometer and Laser* subsection select Camera from the drop down lists.



Image 8-122
Selecting a camera

3. Press the **Start live view** button to see live view of the projected image from the selected camera.

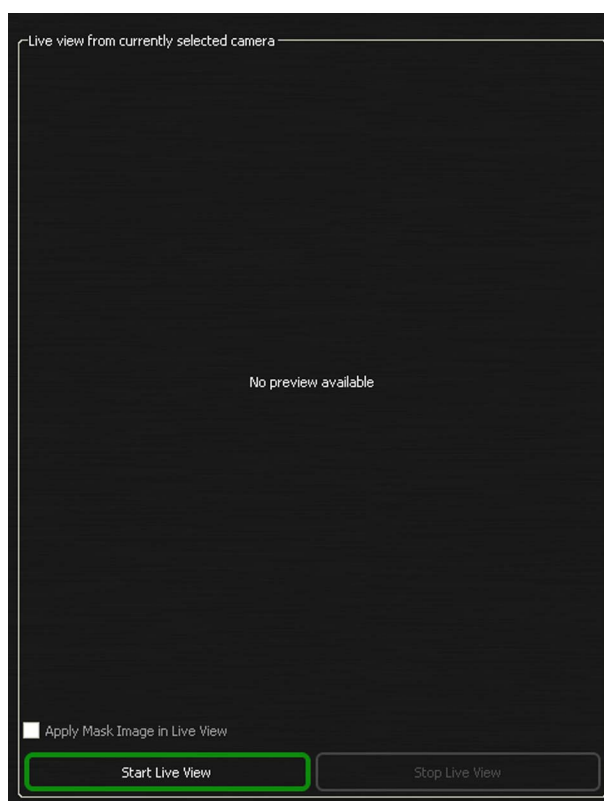


Image 8-123
Starting the live view

Note: Auto Exposure might take some seconds to complete; wait until it is completed.

4. Press the **New** button to define a new position or select an existing position from *Position* drop down list to change it. For a new position, a name must be entered in the *Position* edit box.

8. Getting started

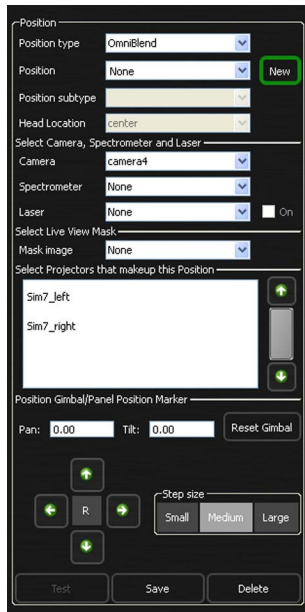


Image 8-124
Creating a new position

Note: Selecting an existing position will highlight the selected projector(s) used in this position and causes the Gimbal to move to the stored orientation for that position.

Note: Use the **Delete** button to delete an existing position, if required.

5. Select the correct AutoAlignment Head location from the *Head Location* drop down list.



Image 8-125
Selecting correct AutoAlignment Head

6. Use the Gimbal control arrows to move the Gimbal until the camera live view shows the desired blend region(s).

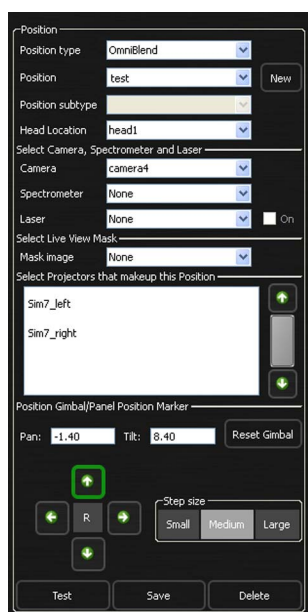


Image 8-126
Navigating to desired blend region

Note: Use the **Step size** buttons to increase or decrease the adjustment steps of the Gimbal.

Note: Press the **R** button to control the Gimbal movements using the navigation buttons on the eRACU hand held unit.

7. From the *Select Projectors that makeup this Position* section, select the projector(s) that make up the blend region(s) for this position.

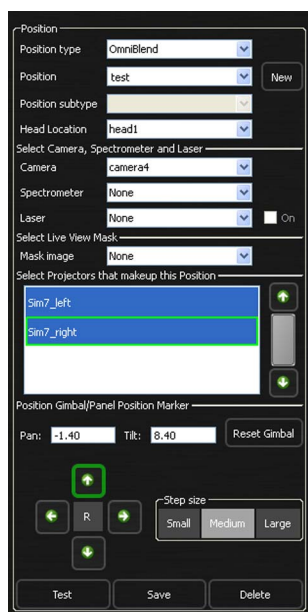


Image 8-127
Selecting the projectors

Note: Make sure that each selected projector is visible from the Head Location that you have selected.

8. Optional: If unwanted objects (artifacts) are visible in the current Camera Live view, they must be masked. Select a suitable mask from the Mask Image drop down list. See "Creating Mask image", page 103.

8. Getting started



Image 8-128
Selecting a suitable mask

Automatically, the check box Apply Mask Image in Live View gets enabled (see the image below). Use it to toggle On/Off mask.

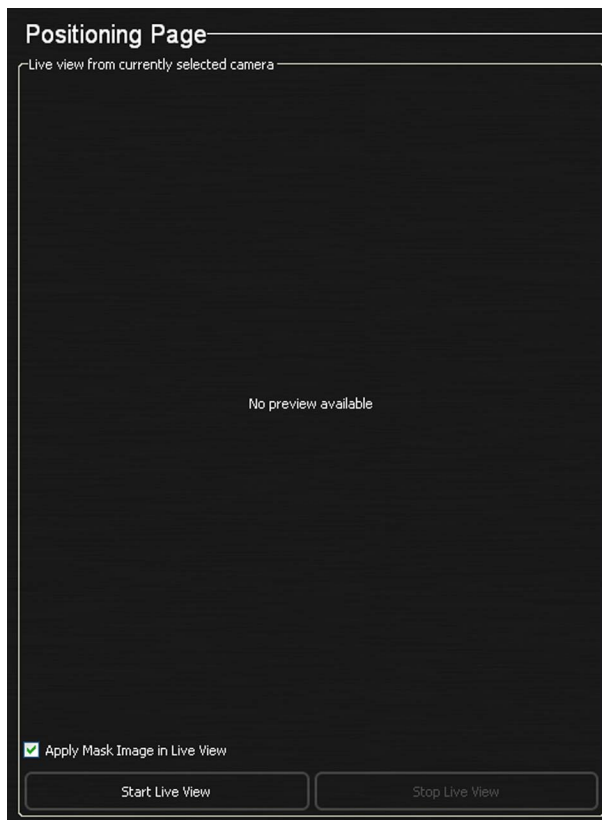


Image 8-129
Masking enabled

9. Press the **Save** button.



Image 8-130
Saving OmniBlend position

Note: If a different AutoAlignment Head location is selected, then you will be prompted to physically position the AutoAlignment Head at the location as indicated in the Alert dialog (multiple AutoAlignment Head locations of OmniBlend are only supported from XDS RACU software version 3.5 onwards).

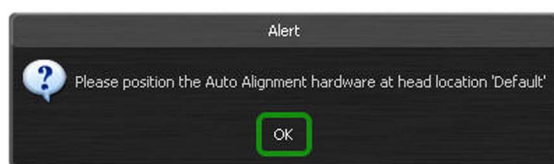


Image 8-131

10. In the appearing *Status Information* dialog press **OK** to save this position or to modify the selected position.

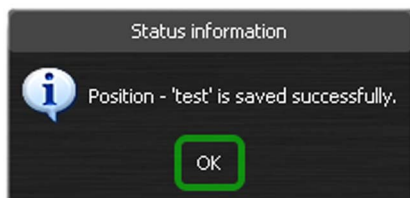


Image 8-132
Saving OmniBlend position named test

11. Repeat steps 4 to 9 to create additional positions until all blend regions are captured from at least one position.

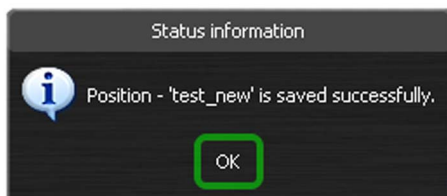


Image 8-133
Saving OmniBlend position named test_new

8.6.5.3 Creating Mask image

Introduction

While defining the OmniBlend positions sometimes specular reflections or light hotspots appears inside the blend regions and/or non-blend regions and become visible in the Camera Live view of that position. Those artifacts in the blend regions must be hidden as it might introduce problem in the blend result. This requires the user to create a mask using any design program: e.g. *MS Paint*, *Adobe Photoshop*, *Gimp*, *Paint.NET*.

8. Getting started

The mask image resolution should be a little bigger than half of the camera resolution:

- Canon EOS 1000D: 1953 x 1301 pixels;
- Canon EOS 1100D: 2176 x 1437 pixels.

It must contain only black and white regions. A black region is used to hide the artifacts and the white regions of the mask will not hide the image. All mask files must be saved as .png files at the following location on the MCU: <C:\Program Files\Barco\XDS\resources\autoalign\maskImages>

In case of XDS RACU Diskless server, all mask files must be saved on a storage server provide by the customer at the following location: \\<MCU_hostname>\shared_folder<MAC_address>\autoalign\maskImages where <MCU hostname> is the diskless MCU server name, shared_folder is a folder on the diskless server and <MAC address> is the MAC address of diskless MCU server.

To know the MAC address of your MCU connected over the network, you may need to follow the steps mentioned below

1. Go to *Start > Connect to > All Connections*
2. Select your Local Area Connections right click it and select Status
3. In the Local Area Connection Status, select Support tab and click Details
4. The MAC address is the Physical Address listed in Network Connection Details.

Examples

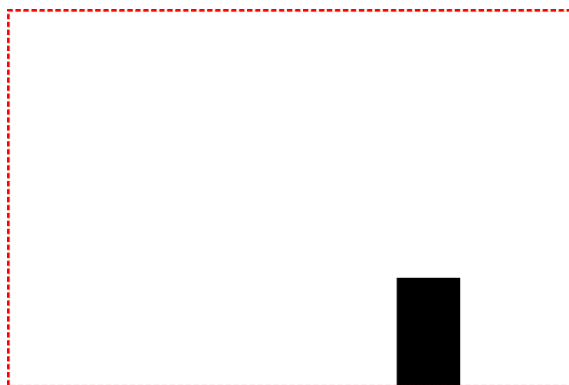


Image 8-134
Example 01



Image 8-135
Example 02

8.7 ECR calibration



This section only applies to projectors that support ECR Calibration (e.g. SIM 7 series, SIM 10).

On SIM 5W a lens with ECR also exists, but this one can not be re-calibrated.

Calibrate ECR

The calibrate ECR function creates a table which indicates the projector light transmission versus its aperture opening. This table is stored in the lens memory and is read by the projector on startup to be used in conjunction with the CCD for Time of Day (TOD) operation

By default, a look-up table is stored in the lens during production. If you suspect that your aperture control is erratic or does not work well, you should use calibrate ECR and create a new LUT. The calibrate ECR function creates a table which measures the projector light transmission versus its aperture opening.

ECR calibration must be performed in a perfectly dark environment. Any ambient light or stray light will lead to a bad LUT.

How to start the ECR calibration process?

1. Open the main page of the XDS RACU user interface.
2. Select a projector.
3. Navigate to *Projector > Calibration* and press it.



Image 8-136
Pressing the Calibration button

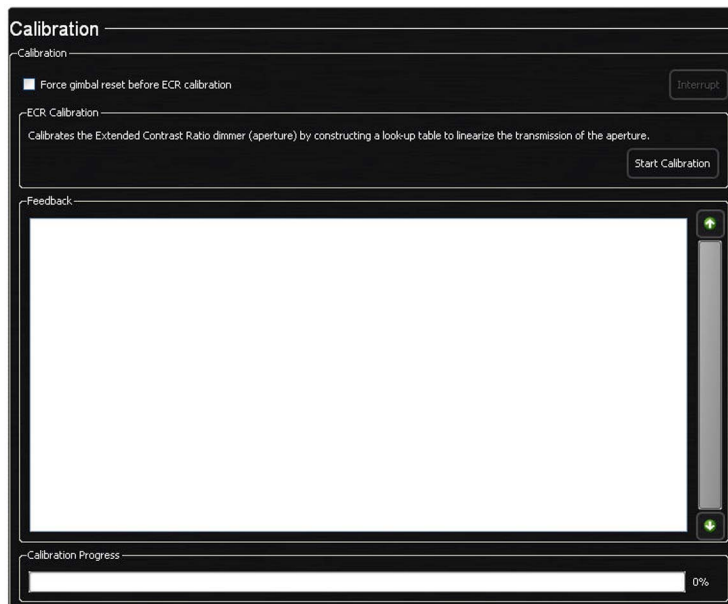


Image 8-137
Calibration page is displayed

4. If you wish to calibrate more than one projector, select the desired projectors or select all.
Note: *Multiple projector selection is possible in the Calibration page.*
5. Press the **Start Calibration** button.

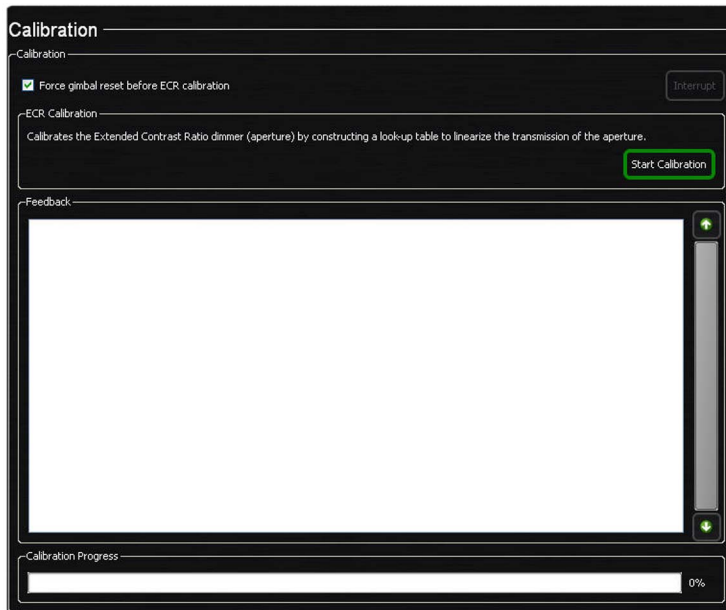


Image 8-138
Start Calibration: button

Note: A good practice is to always check the Force Gimbal reset before capture or realign checkbox.

6. In the appearing *ECR Calibration* dialog:
- press **Selected Group** to start the ECR calibration process to all the projectors of the selected group.
 - press **Selected Projector** to start the ECR calibration process to the selected projectors of the selected group.
 - press **Cancel** to abort the ECR calibration.

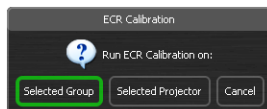


Image 8-139
ECR Calibration dialog

Messages in the feedback section indicate the progress of the ECR calibration.

9. DYNACOLOR™ CALIBRATION

About this section

By default each projector is calibrated in the factory in ideal conditions. This means that Dynacolor calibration (using the buttons **Measure** or **Start Color Alignment**) is not required in the field, except for specific situations. Dynacolor calibration may only be performed by Barco trained and qualified technicians.

Matching the color gamuts of multiple projectors, i.e. matching the Dynacolor sets (**Optimize** button) is normally performed during the alignment of a system if a new Golden Alignment is to be saved.

Overview

- Dynacolor calibration
- Matching Dynacolor sets of multiple projectors
- Dynacolor calibration: Color alignment
- Undoing a color alignment

9.1 Dynacolor calibration



Dynacolor calibration is performed for one projector at a time.



Make sure that Acuras position(s) has been defined for the selected projector prior to performing Dynacolor calibration.



If SIM 5W is used in combination with Acuras, it is required that Dynacolor measured values were measured using the AutoAlignment Head. This means they should be measured from the *DynaColor* page in the XDS RACU user interface using the Measure button.

How to calibrate Dynacolor?

1. Select the projector to be calibrated.
2. Check the *Dynacolor Active* checkbox. See image 9-1.
3. Select the active Dynacolor set of that projector from the drop down list.

Note: A warning message is displayed if the selected set is not active.

The x and y coordinates and L values of the selected active set are updated in the corresponding sections of Measured values and Desired values automatically.

4. Check the *Pause unselected projectors of group* checkbox to pause all the unselected projectors. See image 9-1.
5. Press **Measured**.

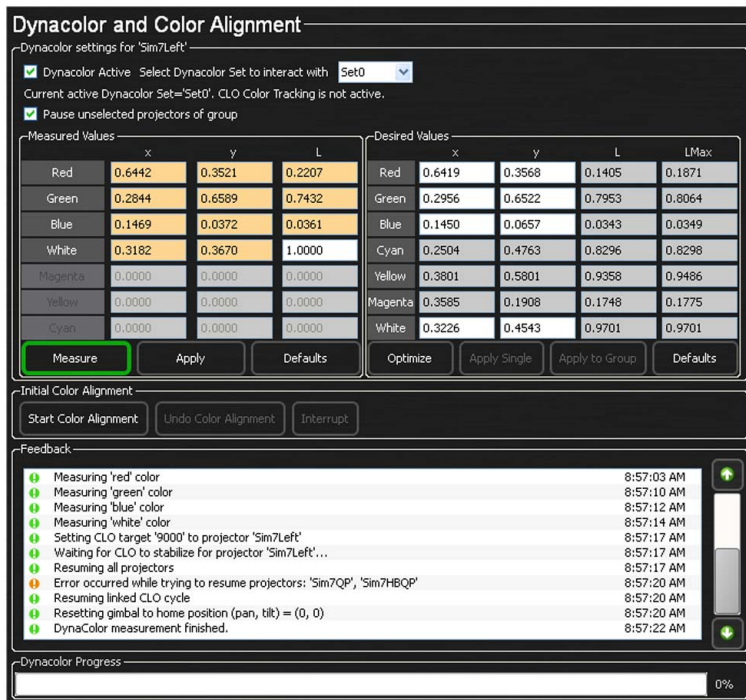


Image 9-1
Measuring the Dynacolor

Note: The measured luminance values, entered in the L fields are automatically rescaled to end up with L=1 for white.

Note: The values highlighted in orange background color are not uploaded to the projector yet.

Note: If different head locations were used during the definition of Acuras positions, the user will be prompted to move the AutoAlignment Head to the corresponding physical locations during the Acuras capture process.

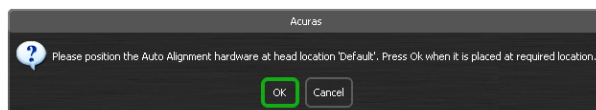


Image 9-2

The automatic calibration process is now started and can take some time.

- Press **Apply** to upload the measured values (x, y and L) to the selected projector.

Dynacolor and Color Alignment

Dynacolor settings for 'Sim7Left'

☒ Dynacolor Active Select Dynacolor Set to interact with Set0

Current active Dynacolor Set='Set0'. CLO Color Tracking is not active.

☒ Pause unselected projectors of group

Measured Values				Desired Values				
	x	y	L		x	y	L	LMax
Red	0.6442	0.3521	0.2207	Red	0.6442	0.3521	0.2207	0.2207
Green	0.2844	0.6589	0.7432	Green	0.2844	0.6589	0.7431	0.7432
Blue	0.1469	0.0372	0.0361	Blue	0.1469	0.0372	0.0361	0.0361
White	0.3182	0.3670	1.0000	Cyan	0.2208	0.3714	0.7792	0.7792
Magenta	0.0000	0.0000	0.0000	Yellow	0.4129	0.5493	0.9638	0.9637
Yellow	0.0000	0.0000	0.0000	Magenta	0.3421	0.1608	0.2568	0.2568
Cyan	0.0000	0.0000	0.0000	White	0.3182	0.3670	0.9999	0.9999

Buttons: Measure, Apply, Defaults, Optimize, Apply Single, Apply to Group, Defaults

Initial Color Alignment

Start Color Alignment, Undo Color Alignment, Interrupt

Feedback

- Measuring 'blue' color 8:57:12 AM
- Measuring 'white' color 8:57:14 AM
- Setting CLO target '9000' to projector 'Sim7Left' 8:57:17 AM
- Waiting for CLO to stabilize for projector 'Sim7Left'... 8:57:17 AM
- Resuming all projectors 8:57:17 AM
- Error occurred while trying to resume projectors: 'Sim7QP', 'Sim7HBQP' 8:57:20 AM
- Resuming linked CLO cycle 8:57:20 AM
- Resetting gimbal to home position (pan, tilt) = (0, 0) 8:57:20 AM
- DynaColor measurement finished. 8:57:22 AM
- Projector 'Sim7Left': Applying Measured values... 8:59:05 AM
- Projector 'Sim7Left': Measured values applied successfully. 8:59:06 AM

Dynacolor Progress

0%

Image 9-3
Applying the measured value

Note: The x and y coordinates and L values of the selected projector are updated in the Desired values section automatically. See image 9-3.

Message “Inconsistent data”

After Dynacolor calibration, it can happen that an error message pops up. If the sum of the L values of Red, Green and Blue does not equal the L value of White in the measured values, the error message *Inconsistent data* appears. This can be caused by one of the following situations:

- There was **too much ambient light** or stray light during the measurement. Redo the measurement after all ambient light has been turned off.
- CLO was active during the measurement. **CLO must be turned off** prior to starting the Dynacolor calibration.
- Too much **lamp flicker** during the calibration. Try again. If the problem persists, lamp replacement is advised.

9.2 Matching Dynacolor sets of multiple projectors



Matching Dynacolor sets is performed by the Optimize function (See Optimize button on the *Dynacolor* page in the XDS RACU user interface).



Matching Dynacolor sets is used to match the Dynacolor sets of multiple projectors or to match Left eye and Right eye set in one single stereo projector.



Make sure that Acuras position(s) have been defined for each projector of the selected group prior to running the Dynacolor Optimize process.

How to match Dynacolor sets of multiple projectors?

- Optionally, calibrate Dynacolor for one or more projectors of the group. See "Dynacolor calibration", page 107.
- Select the group to be calibrated.
- Select a projector in that group.

9. Dynacolor™ calibration

4. Uncheck the *Pause unselected projectors of group* checkbox to unpause all the unselected projectors of this group. See image 9-4.
5. Press **Optimize** to calculate the common desired values for all the projectors in the selected group.

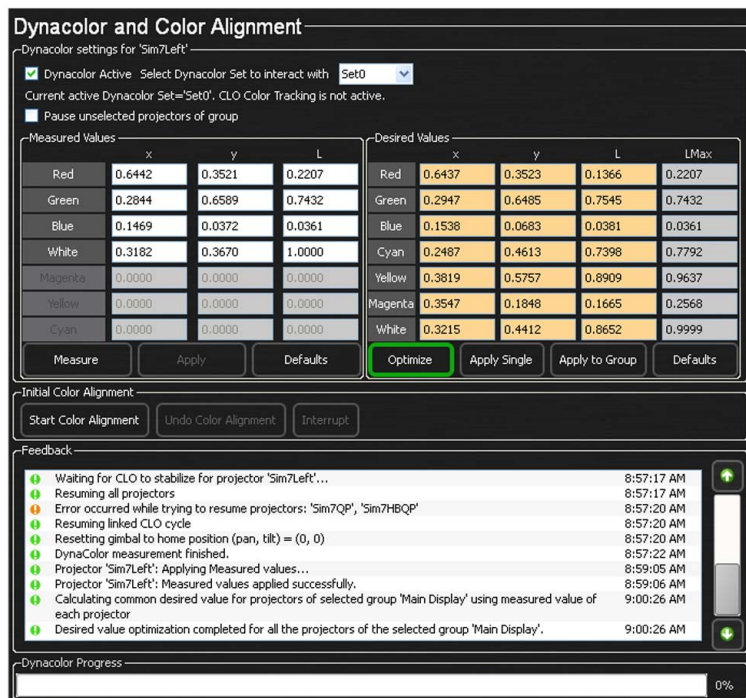


Image 9-4

Desired values calculated

Note: The values highlighted in orange background color are not uploaded to the projector yet.

A message appearing in the feedback section shows the progress information. See image 9-4.

6. Press **Apply to Group** button to apply the calculated desired values to all the projectors of the selected group.
7. In the appearing *Confirm Dynacolor Alignment* dialog press **Yes** to confirm and proceed

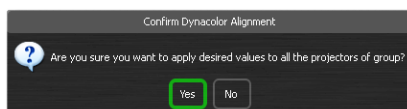


Image 9-5

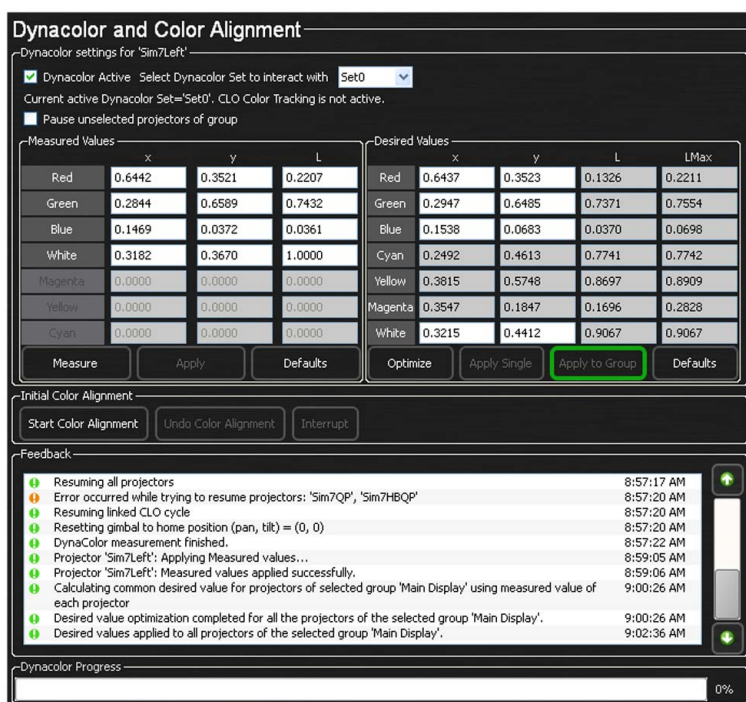


Image 9-6
Desired values applied successfully to all projectors

- If there still is some color variation in the final image from projector to projector you may need to adjust the desired values manually.
- Identify the projector(s) due to which there is a color variation.
- Select one of the identified projectors and adjust its desired white point and primary color x and y values. See image 9-7.
- Press the **Apply Single** button to upload the newly adjusted desired value(s) to that projector.

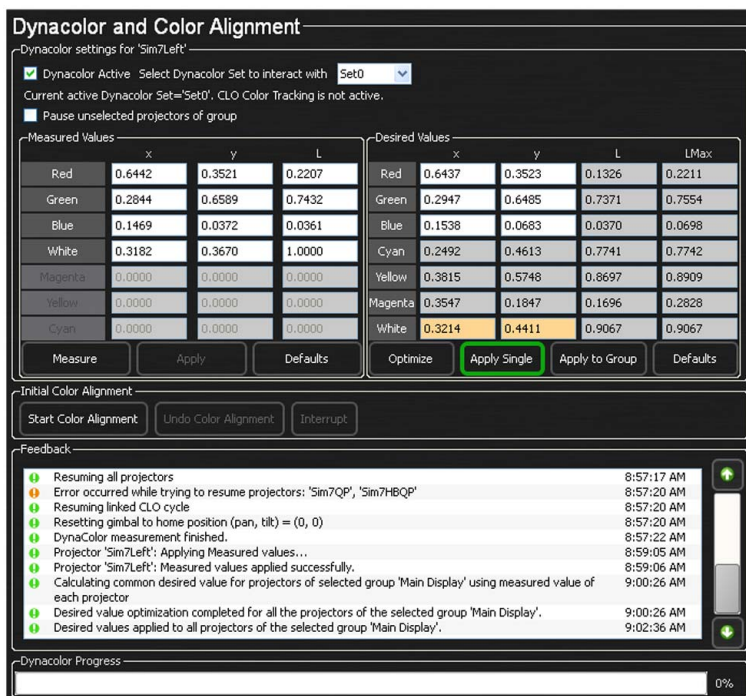


Image 9-7
Desired white point values applied successfully to the selected projector

- Repeat steps 9 to 11 until remaining color variations on the system are minimized.

9.3 Dynacolor calibration: Color alignment

Description

The **Start Color Alignment** feature provides you an alternate and faster way of performing the Dynacolor calibration on all projectors simultaneously and automatically, thus eliminating the time consumed in calculating the measured values (**Measured** button) for each projector in turn and matching color gamut (**Optimize** button) of all projectors in a Dynacolor calibration procedure. If pressed, the XDS RACU system automatically and simultaneously calculates the colors measured value for each projector in a group and matches the color gamut of all projectors.

How to start the color alignment process?

1. Select the projector in a desired group
2. Open the Dynacolor page
3. Check the *Dynacolor Active* checkbox..
4. Select the active Dynacolor set of that projector from the drop down list.

Note: A warning message is displayed if the selected set is not active.

The x and y coordinates and L values of the selected active set are updated in the corresponding sections of Measured values and Desired values automatically.

5. Check the *Pause unselected projectors of group* checkbox to pause all the unselected projectors.
6. Press **Start Color Alignment** to automatically start the Dynacolor calibration process on all projectors in a group simultaneously

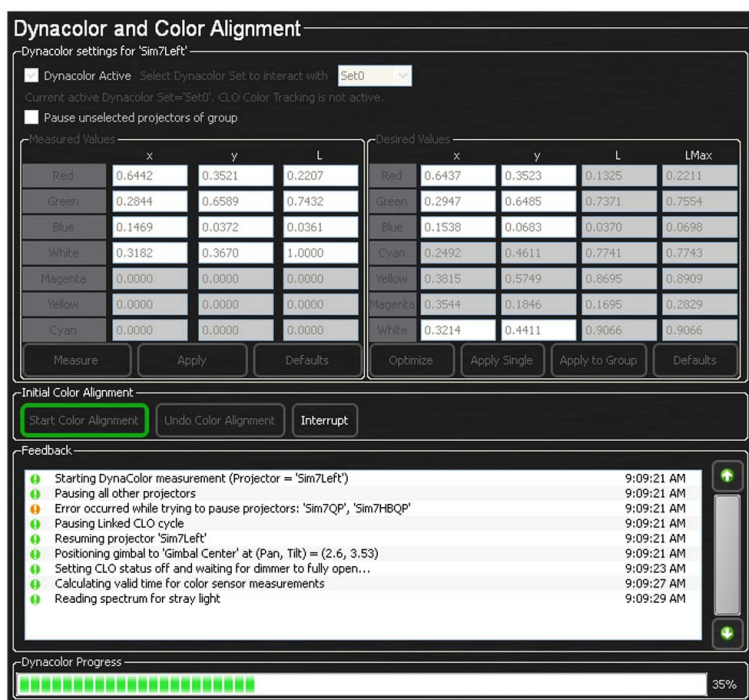


Image 9-8
Stating the color alignment process

7. In the appearing *Perform Initial Color Alignment* dialog press **Yes** to confirm and proceed

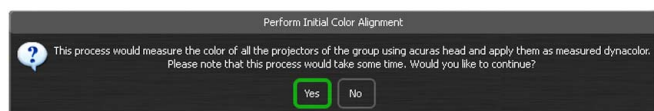


Image 9-9

Note: If different head locations were used during the definition of Acuras positions, the user will be prompted to move the AutoAlignment Head to the corresponding physical locations during the Acuras capture process.

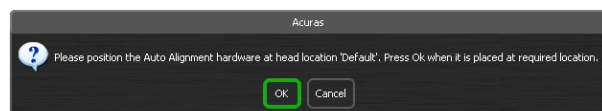


Image 9-10

Measured values are calculated and color gamuts are matched for all projectors.

8. In the appearing *Confirm Dynacolor Alignment* dialog press **Yes** to upload the desired values to all projectors in a group

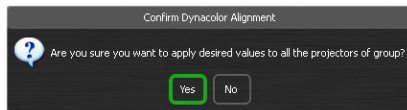
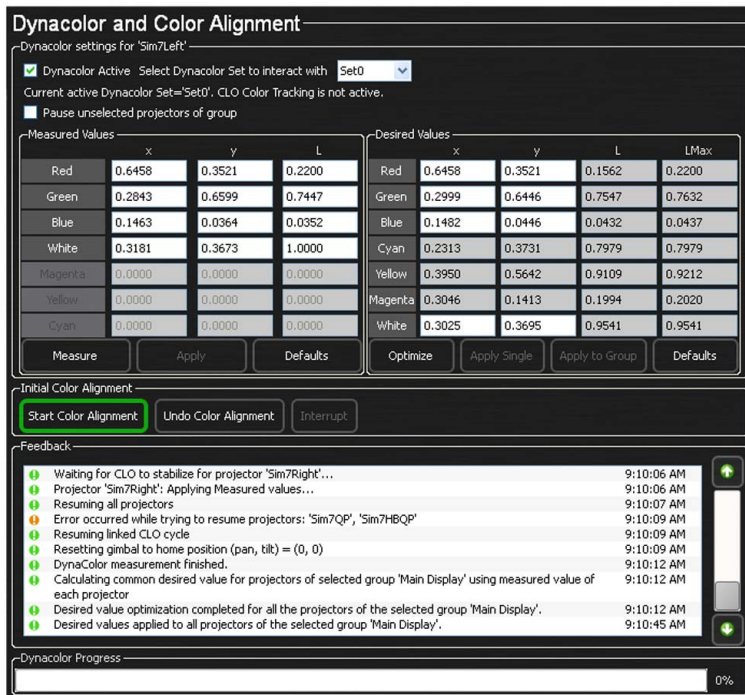


Image 9-11

Image 9-12
Desired values applied successfully to all projectors

Pressing the **Interrupt** button stops the ongoing Color Alignment process. The Gimbal returns to its home position and the following confirmation dialog appears. The system will return to its previous situation and no data will be lost

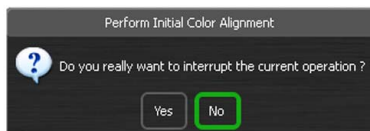


Image 9-13

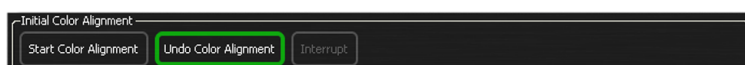
9.4 Undoing a color alignment

Description

While performing a color alignment, it can happen that the result is not satisfactory (i.e. color - color variation between the channels). Pressing **Undo Color Alignment** overrides the value changes saved during this color alignment, ending up with the values of the previous color alignment.

How to undo a color alignment?

1. Navigate to the *Dynacolor* page
2. Press **Undo Color Alignment**

Image 9-14
Pressing the Undo Color Alignment

3. In the appearing Undo Initial Color Alignment dialog do either of the following:

9. Dynacolor™ calibration

- press **Undo Measured** to restore the previous measured values on all projectors in group
- press **Undo Desired** to restore the previous desired values on all projectors in group
- press **Undo Both** to restore both previous measured and desired values on all projectors in group
- press **Close** to abort the process and close the dialog

Note: It is generally advice to always select the options **Undo Both**, for the satisfactory color alignment restoration.

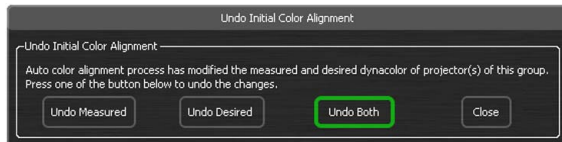


Image 9-15
Selecting the undo options

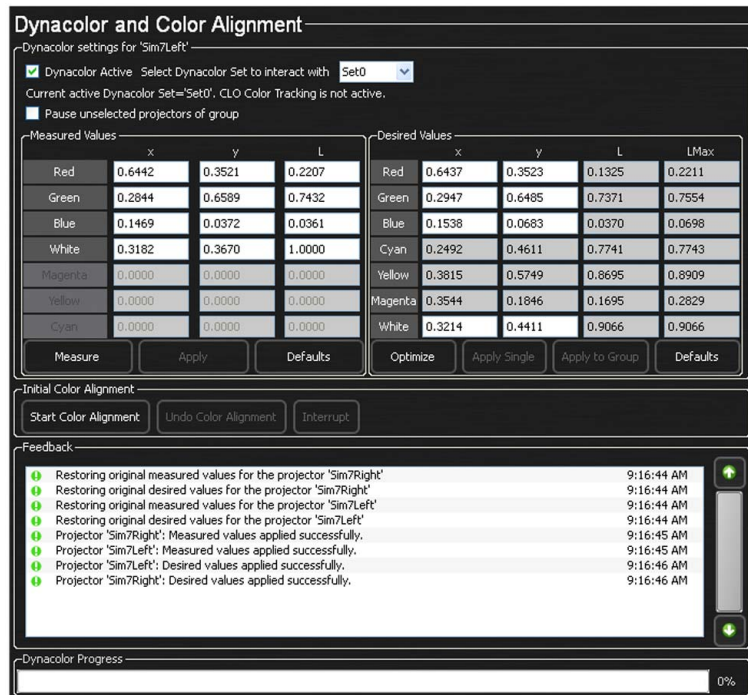


Image 9-16
Undo color alignment process completed

10. OPERATING ACURAS

About this chapter

Acuras is the module of the AutoAlignment Head that can measure colors, brightness and white uniformity on each channel of a display and that can make adjustments to the projector settings to come as close as possible to a previously defined reference state of this display.

This chapter describes the CLO regression principle, states the limits of the system and explains how to operate the AutoAlignment Head:

- **Gray Level Correction (GLC):** over time, some grey level change can occur in the response of an LCoS projector. This can be corrected by performing GLC. This operation may only be performed by Barco trained and qualified technicians. It is recommended to perform Gray Level Correction once for every projector at the start of an installation when working towards a set of Golden Alignments.
- **Acuras Capture:** when a full system alignment has been completed by a system implementation engineer, he should perform an Acuras Capture to learn the brightness and color characteristics of this **Golden Alignment** to XDS RACU. A Capture stores the current parameters of all projectors together with the measurement results that are obtained by the AutoAlignment Head. This set of parameters and measurement will be the reference for future realignments. Additional Golden Alignments can be set and captured for other Display system alignments, e.g. Day mode, Night mode, Dusk mode, etc.;
- **Acuras Realign:** is used to realign a display system of which colors, brightness and/or uniformity have drifted in time; i.e. the projector parameters are adjusted to get the display system back to the reference state. It is possible to undo the latest Acuras Realign if the result turns out not to be satisfactory. After a major system change (e.g. all lamps have been replaced, a projector has been replaced) all Realignment data can be deleted to start back from the Captured state;
- **Dynacolor calibration:** This operation has been performed in ideal conditions during factory alignment of a projector and should not to be redone, except in very specific situations. This operation may only be performed by Barco trained and qualified technicians.

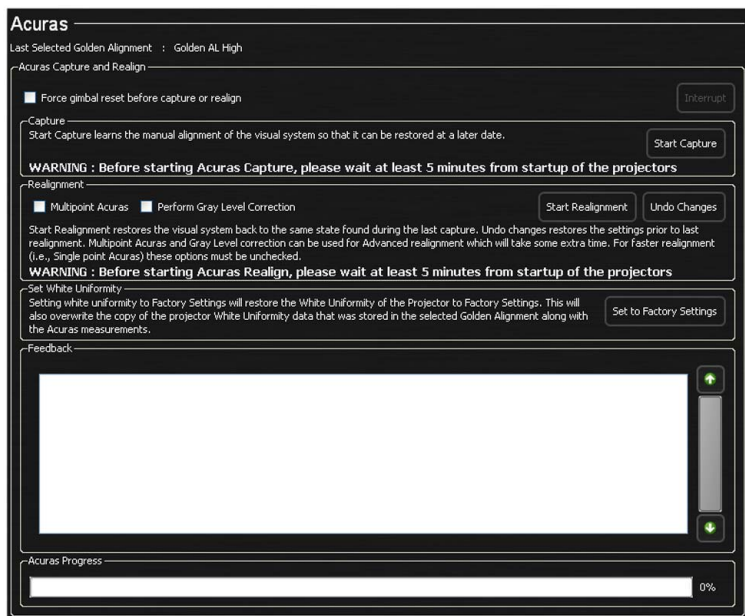


Image 10-1
Acuras page



Prior to running the Acuras capture and realignment, all stray light must be extinguished, the display area must be kept fully dark. This includes infrared (IR) sources, such as illuminators for IR cameras.



See R59770566 — *API Commands for XDS RACU Software* for the Acuras commands which can be initiated through the API.

Overview

- Preconditions
- Gray Level Correction
- Acuras Capture
- Acuras Realignment
- Undoing an Acuras realignment
- Restoring the white uniformity factory settings
- Deleting Acuras realignment data

10.1 Preconditions

About this section

It is important to know the behavior of Acuras Capture and Realignment features prior to start operating it. This section lists the limits and provides useful information about some features like CLO regression.

Before you start operating Acuras, it is crucial to have good understanding of the following items (see XDS RACU User guide R59770508):

- Dynacolor
- Light output
 - Golden Alignments
 - Aperture control (ECR transmission)
 - Dimmer control (CLO target, dimmer transmission)
 - TOD control
- Gray scale.

Overview

- CLO regression principle
- Conditions for Acuras Capture and Realign

10.1.1 CLO regression principle

Introduction

During the lifetime of a lamp, the **light output of the projector gradually drops**. By the end of its lifetime, the lamp may have dropped to 50% of its initial value. The lumen maintenance curve is slightly different for each lamp.

To guarantee a constant light output over a period of time, we can limit the light output of each projector of a display system to a value which is lower than the highest light output of the weakest projector by using the projectors' dimmers (i.e. enabling CLO and setting a **CLO target** in a Golden Alignment). While the light output of a lamp is decreasing, the dimmer transmission is automatically increased to compensate for this.



Make sure that the CLO feature of each projector is activated.

At a certain time, the dimmer transmission of one projector reaches 100%. From that time on, this projector is not able to meet the CLO target any longer and its image becomes dimmer than the other channels.

If now an **Acuras realign** is performed, the CLO target of each projector is decreased by 10% and a dialog box pops up to ask if you accept the reduced target as it is currently presented to you. In the case where a CLO target drop of 10% is not enough and still one projector can not meet its reduced CLO target, again all CLO targets will be lowered by 10% until all projectors can achieve their individual CLO target.

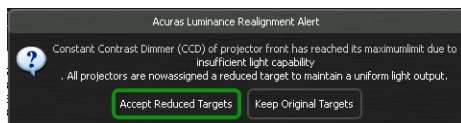


Image 10-2
Realign: reduced targets dialog box

If the reduced target has been accepted by the operator, the dimmer will again be able to compensate for further lamp light output recession during the next period of time.

When lamps come to the **end of their lifetime**, they need to be replaced by new ones. If an Acuras realign is performed after replacement of all lamps of the display system, the CLO targets are set to their initial values again and a dialog box pops up to ask if you accept these initial targets.

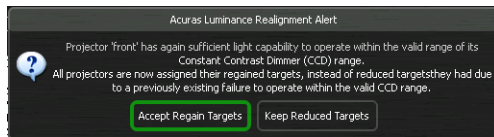


Image 10-3
Realign: regain targets dialog box

This principle is clearly explained in the image below.

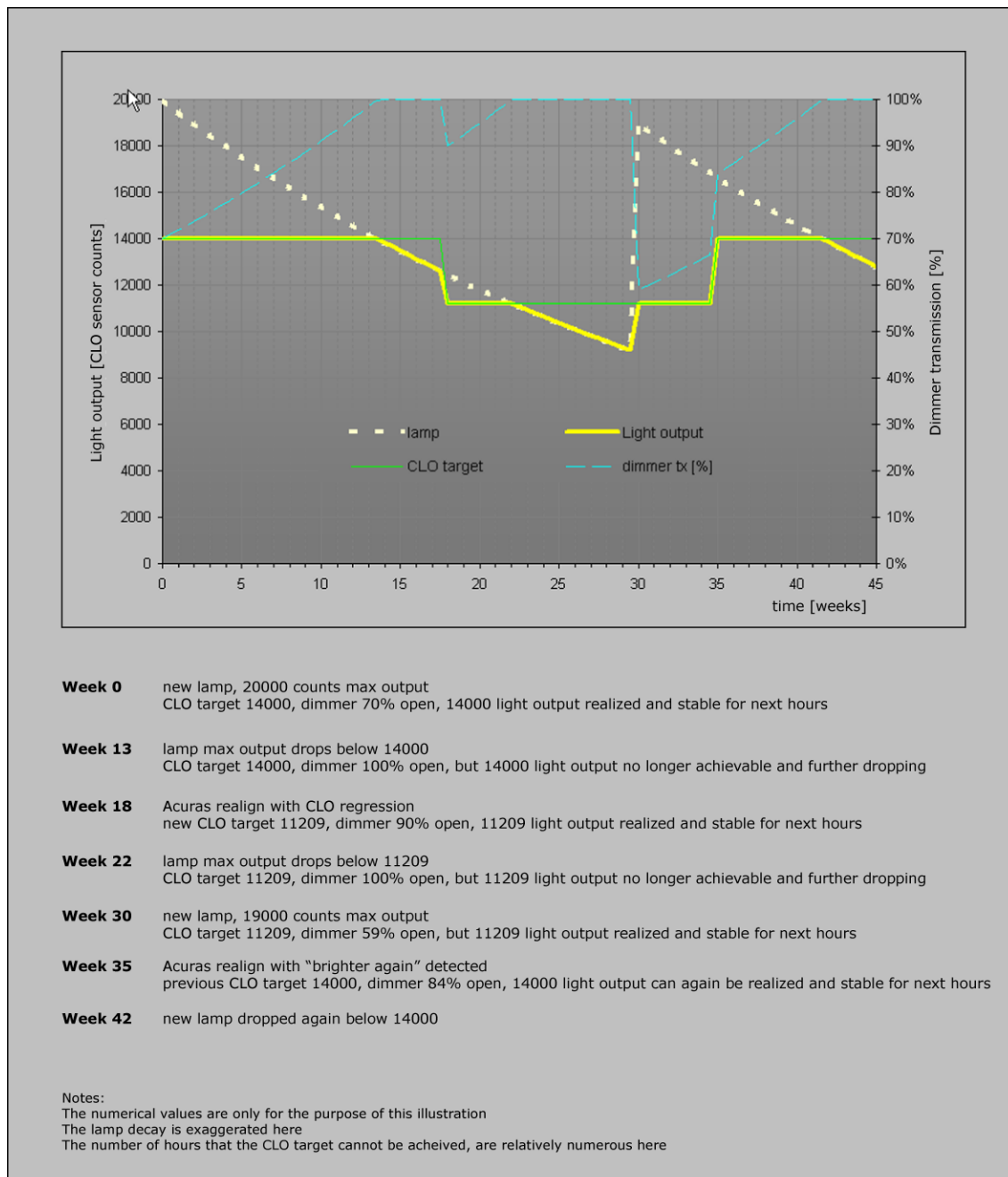


Image 10-4
CLO regression principle

10.1.2 Conditions for Acuras Capture and Realign

SIM 5W in combination with Acuras

If SIM 5W is used in combination with Acuras, it is required that Dynacolor measured values were measured using the AutoAlignment Head. This means they should be measured from the *DynaColor* page in the XDS RACU user interface using the **Measure** button.

Minimum brightness level

A minimum system brightness of one Foot-Lambert (fL) is required to perform a reliable Acuras Capture or Acuras Realign.

Minimum dimmer transmission in SIM 5W

In case of a SIM 5W projector, the CLO target settings must result in a dimmer transmission (CCD dimmer transmission) of 15% or higher. If the CLO target is set to a value that results in a dimmer transmission below 15%, an error message will pop up. Remember that next to this, the lower limit of the CLO target value is 200.

Maximum dimmer transmission during Acuras capture

In a system where the **CLO** is activated and a **CLO target** is defined in the Golden Alignment, the dimmer transmission is adjusted in function of the lamp light output to maintain the image brightness: a decreasing lamp light output (due to lamp aging) is compensated by an increasing dimmer transmission.

To ensure a brightness level that lasts for a considerable amount of time, it is important to provide for enough dimmer transmission **headroom** while storing the highlights of a Golden Alignment and doing an Acuras capture: setting a CLO target that results in a dimmer transmission of 7000 or 70% results in 30% dimmer transmission headroom.

Once the headroom has been fully used (i.e. dimmer transmission is 100%) an Acuras Realign can be performed, leading to a new set of targets proposed by Acuras. This is the CLO regression principle.

By default, the maximum allowed dimmer transmission (CCD transmission) during an Acuras capture is **8000** (or **80%**), which results in 20% dimmer transmission headroom.

This maximum allowed dimmer transmission value can be changed in the XDS RACU user interface however. It can be set to a value up to 10000, resulting in no dimmer transmission headroom at all. In that case, the image brightness level will be maintained for a couple of days only, which means that after a short period of time you will notice brightness differences between the channels of your display system. The need for an Acuras Realignment will come up very soon.

Browse to *Options > Auto Alignment > Acuras* and change the value in the edit box next to *Maximum dimmer*.

Options	
Auto Alignment Options	
General	Acuras
Red channel ratio margin	0.010
Green channel ratio margin	0.020
Blue channel ratio margin	0.025
Start Multipoint Fade-out	0.2
Stop Multipoint Fade-out	0.4
Integration time warning level	1000000
Integration time error level	2000000
Maximum dimmer	8000

Password protected Auto Alignment parameters may only be changed by authorized Barco personnel.

Save Settings Set Defaults Enter Password

Image 10-5
Capture: maximum dimmer

10.2 Gray Level Correction



This chapter only applies to LCoS projectors.

Overview

- Starting the Gray Level Correction process
- Restoring the Gray Level Correction
- Undoing the Gray Level Correction

10.2.1 Starting the Gray Level Correction process

Overview

Gray Level Correction is used to compensate for the changes in the gray level curve of the projector by optimizing the projector's gray scale tracking. It should be run prior to starting a new display system alignment when working towards a set of Golden Alignments. It is not required to run Gray Level Correction on each realignment.

This operation may only be performed by Barco trained and qualified technicians.

How to start the Gray Level Correction process?

1. Select a projector.
2. In the Adjust Gray Scale page, press the tab Gray Level Correction.

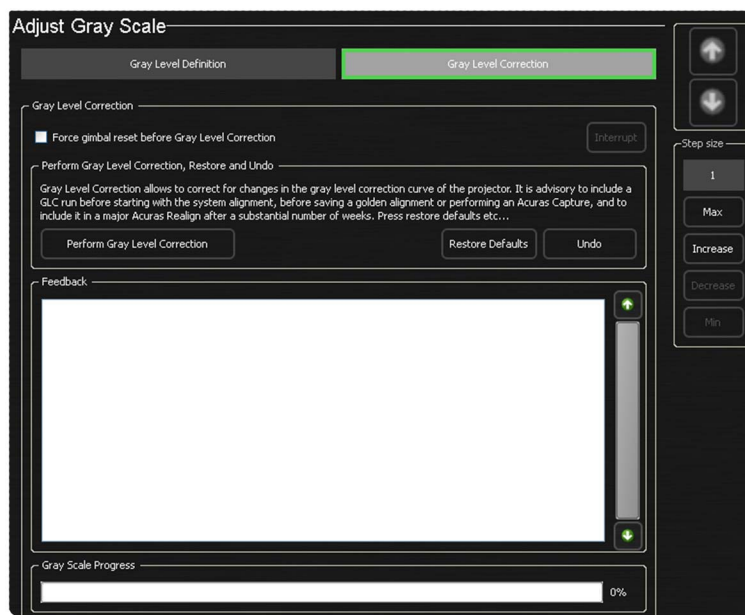


Image 10-6
Gray Level Correction page

3. If you wish to calibrate more than one projector, select the desired projectors or select all projectors in that group.
4. Press the **Perform Gray Level Correction** button. See the image above.
5. In the appearing *Gray Scale* dialog:
 - press **Selected Group** to start the Gray Level Correction process to all projectors of the selected group.
 - press **Selected Projector** to start the Gray Level Correction process to the selected projector(s) of the selected group.
 - press **Cancel** to abort the Gray Level Correction process.

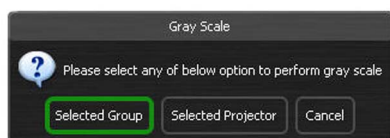


Image 10-7
Gray Scale dialog

Note: If an additional head location is defined or if you have selected projector(s) that have a different head location, the following Acuras dialog appears. This reminds the user to physically position the AutoAlignment Head to the head location mentioned in the dialog. Press **OK** to start the Gray Level Correction process.

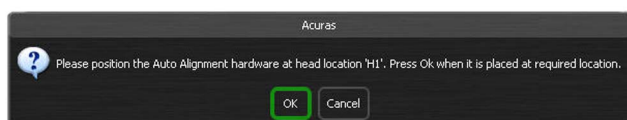


Image 10-8
Acuras dialog: head location "H1"

Gray Level Correction process is started.

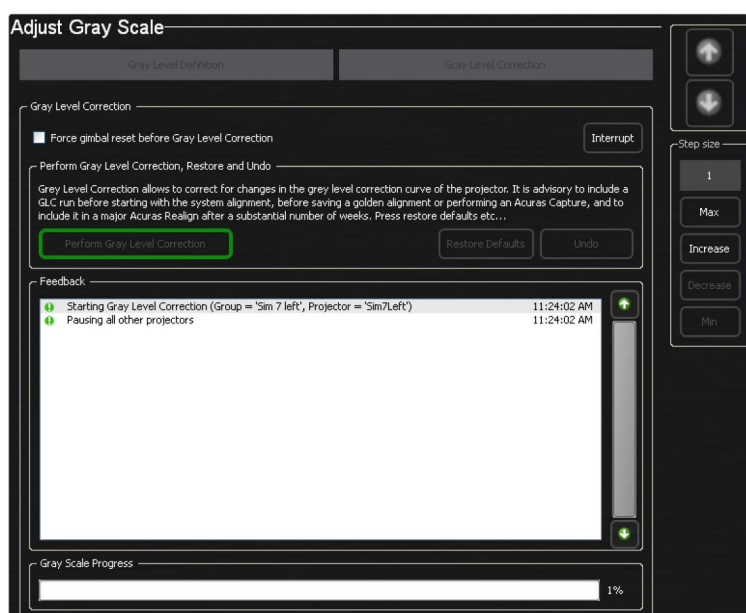


Image 10-9
Gray Level Correction process is started

The unselected projector(s) and the projector(s) on which the Gray Level Correction process is not running go to pause state.



Pressing the Interrupt button will stop the Gray Level Correction process. The Gimbal will come back to its home position and the following confirmation dialog appears. The system will return to its previous situation and no data will be lost.

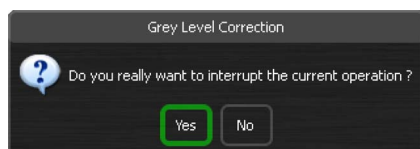


Image 10-10

10.2.2 Restoring the Gray Level Correction

Overview

The Restore Defaults function allows you to restore the Gray Level Correction values to the factory defaults.

How to restore the factory Gray Level Correction values?

1. In the Gray Level Correction page, navigate to **Restore Defaults** and press it.

2. In the appearing *Gray Scale* dialog,
 - press **Selected Group** to start the restore Gray Level Correction process to all projectors of the selected group.
 - press **Selected Projector** to start the restore Gray Level Correction process to the selected projector(s) of the selected group.
 - press **Cancel** to abort the restore Gray Level Correction process.



Image 10-11
Acuras dialog: restoring the Gray Level Correction values

10.2.3 Undoing the Gray Level Correction

Overview

The Undo function restores the settings that were active before the current Gray Level Correction.

How to undo the Gray Level Correction value?

1. In the Gray Level Correction page, navigate to **Undo** and press it.
2. In this appearing *Gray Scale* dialog,
 - press **Selected Group** to start the undo Gray Level Correction process to all projectors of the selected group.
 - press **Selected Projector** to start the undo Gray Level Correction process to the selected projector(s) of the selected group.
 - press **Cancel** to abort the undo Gray Level Correction process.



Image 10-12
Acuras dialog: undoing the Gray Level Correction values

10.3 Acuras Capture

Acuras Capture

Acuras acts as a Realignment tool. Its purpose is to restore **brightness, colors** and optionally **white uniformity** to a reference alignment. Therefore, Acuras must first **learn** how the initial colors, brightness and white uniformity look by performing the **Acuras Capture** process. When executing Capture, the colors and brightness of the current system alignment at the center of each channel (Acuras 1-point) and optionally the white uniformity of each channel at nine Gimbal positions (Acuras Multi-point) are stored. To be able to restore the original brightness value on a later moment, sufficient headroom on all projector dimmer positions is required during Capture. Therefore, a dimmer transition up to only 8000 (= 80%) is allowed at Capture time. If the dimmer transmission in any of the projectors on which the Capture procedure is executed is higher than 80%, an error will be returned by Acuras Capture. Also see "Conditions for Acuras Capture and Realign", page 118.

Capture has to be performed for every Golden Alignment set, where it is possible (see "Conditions for Acuras Capture and Realign", page 118). To do so, activate the Golden Alignment set and run the Acuras Capture procedure.

Acuras Capture is to be run only when the system is fully aligned i.e. a Golden Alignment set of parameters must be saved for which luminance and colors (red, green, blue and white) across all channels are matching and white uniformity of each channel is fine.

During Acuras Capture all stray light in the display must be avoided. All light on the screen other than the projector light must be eliminated.



For each Golden Alignment set, a Capture must be performed. Only then a Realign will be possible. Best practice is to perform a Capture for all projectors of the selected group.



For each projector that is part of a group for which a Golden Alignment has been saved and a Capture will be performed, at least the Acuras Single-point position must be defined. To have better uniformity within each display channel, it is advisory however to have Acuras Multi-point position defined for each projector.



By default, the patterns on which the automatic brightness and color measurements are performed are generated in the projectors.

How to start the Acuras capture process?

1. Select a projector from a group for which you want to perform an Acuras Capture.
2. Optional: Execute Gray Level Correction for the selected projector(s) of a group.
Note: For optimum performance of the system, it is advised to execute Gray Level Correction before the manual system alignment and creation of the Golden Alignment. See "Starting the Gray Level Correction process", page 119.
3. Navigate to the *Light Output* page and activate a Golden Alignment set.

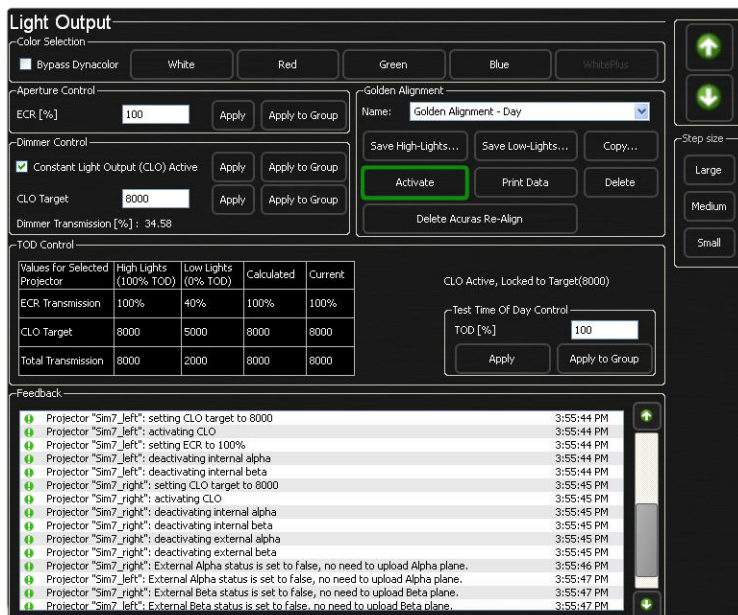


Image 10-13

Note: The active Golden Alignment set name appears at the top of the Acuras page. In case no Golden Alignment is selected, capture can not be executed.

4. Navigate to the *Acuras* page and make either of the selections:
 - If you wish to calibrate more than one projector, select the desired projectors or select all projectors in that group.



Image 10-14
selecting the desired projector(s)

- select group, if you wish to calibrate all projectors of this group.



Image 10-15
group selected

5. Press **Start Capture**.

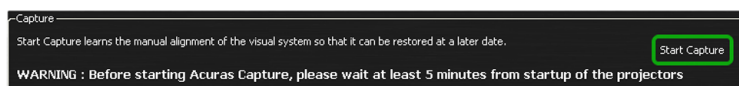



Image 10-16
Start Capture button

Caution: Following warning message appears (see ) in the feedback window, if the calibration file of the spectrometer is missing or doesn't exist. In that case, upload the spectrometer calibration file to the correct location on the MCU (see "Uploading the spectrometer calibration file", page 41) and restart the XDS RACU application followed by restarting the Acuras capture process.

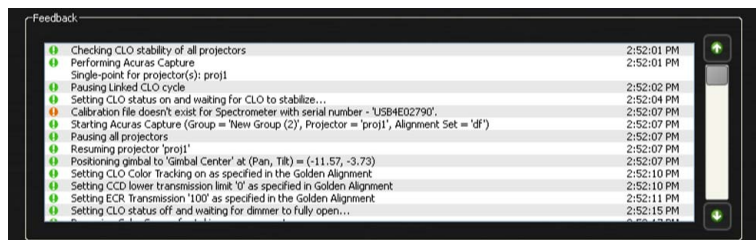


Image 10-17
Feedback window: Spectrometer calibration file is missing

6. In the appearing Acuras dialog,

- press **Selected Group** to run the Acuras capture process to all projectors of the selected group.
- press **Selected Projector** to run the Acuras capture process to the selected projector(s) of the selected group.
- press **Cancel** to abort the Acuras capture process.



Image 10-18
Acuras dialog

Note: The unselected projector(s) and the projector(s) on which the Acuras capture process is not running go to pause state.

Note: If different head locations were used during the definition of Acuras positions, the user will be prompted to move the AutoAlignment Head to the corresponding physical locations during the Acuras capture process.

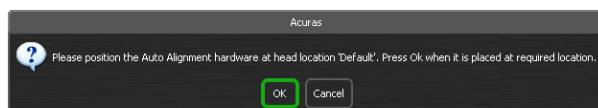


Image 10-19

It may take a few minutes to complete the Acuras capture operation for each projector.

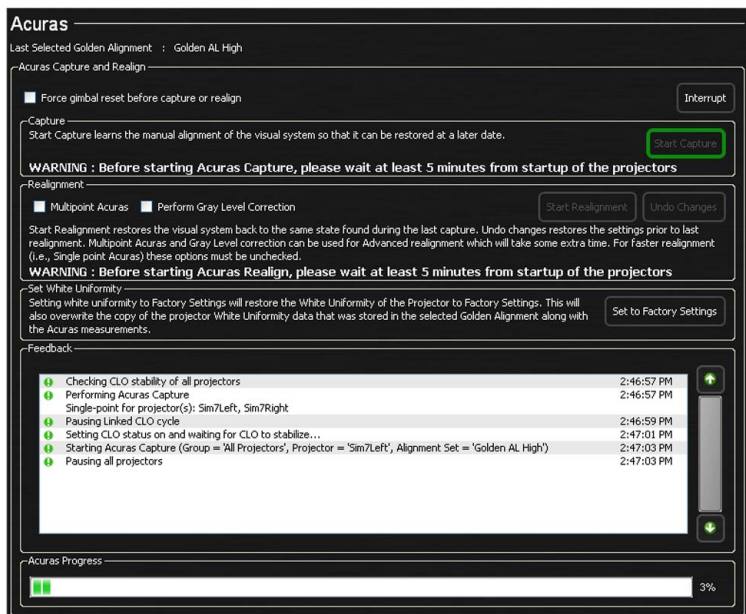


Image 10-20
Acuras capture process in progress



Pressing the Interrupt button stops the Acuras Capturing process. The Gimbal returns to its home position. and the following confirmation dialog appears. The system will return to its previous situation and no data will be lost.

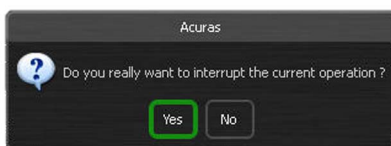


Image 10-21

10.4 Acuras Realignment

Acuras Realignment

Executing Realignment realigns colors and brightness of the system and optionally white uniformity of each channel to the values measured at Capture time. If the brightness can not be restored to the original or reference value because a projector dimmer reaches 100%, Acuras Realignment lowers the CLO targets of all projectors and returns a confirmation message.

Acuras Realignment is done on an as-needed basis to maintain an optimal visual display. A user can choose between fast realignment (Simple Acuras) and advanced alignment (Advanced Acuras). In an advanced realignment some steps are added.

- Gray level correction: restore the gray level tracking of the projector.
- Multi-point Acuras: restore the projector white uniformity to the initial measured values.

The following Acuras Realignment operations are possible:

- **Simple Acuras:** uncheck both *Multi-point Acuras* and *Perform Gray Level Correction* check boxes. Now only single point Acuras realignment is performed: colors and brightness amongst the channel center points are matched.

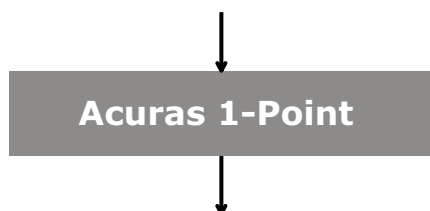


Image 10-22
Simple Acuras

- **Advanced Acuras 1:** check the *Multi-point Acuras* check and uncheck the *Perform Gray Level Correction* checkbox. In this case the following Acuras realignment is performed:

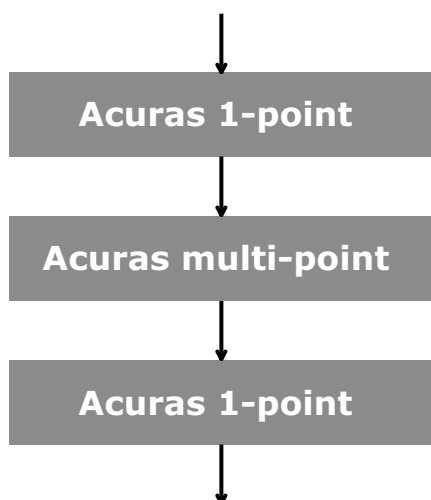


Image 10-23
Advanced Acuras 1

- **Advanced Acuras 2:** check both *Multi-point Acuras* and *Perform Gray Level Correction* check boxes. In this case the following Acuras realignment is performed:

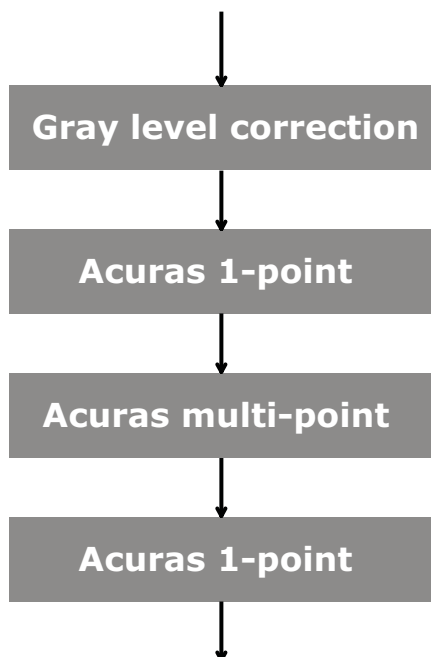


Image 10-24
Advanced Acuras 2

- **Advanced Acuras 3:** uncheck the *Multi-point Acuras* checkbox and check the *Perform Gray Level Correction* checkbox. In this case the following Acuras realignment is performed:

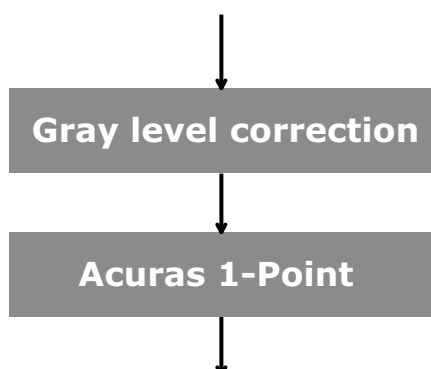


Image 10-25
Advanced Acuras 3



CAUTION: Acuras Realignment requires a spurious light free system. Before performing it, all light on the screen other than the projector light must be eliminated.



The best practice is to always run the Acuras realignment on all projectors in the selected group in order to achieve a good result.



By default, the patterns on which the automatic brightness and color measurements are performed are generated in the projectors.

How to start the Acuras Realignment process?

1. Select a projector.
2. Navigate to the *Light Output* page and activate the required Golden Alignment set.

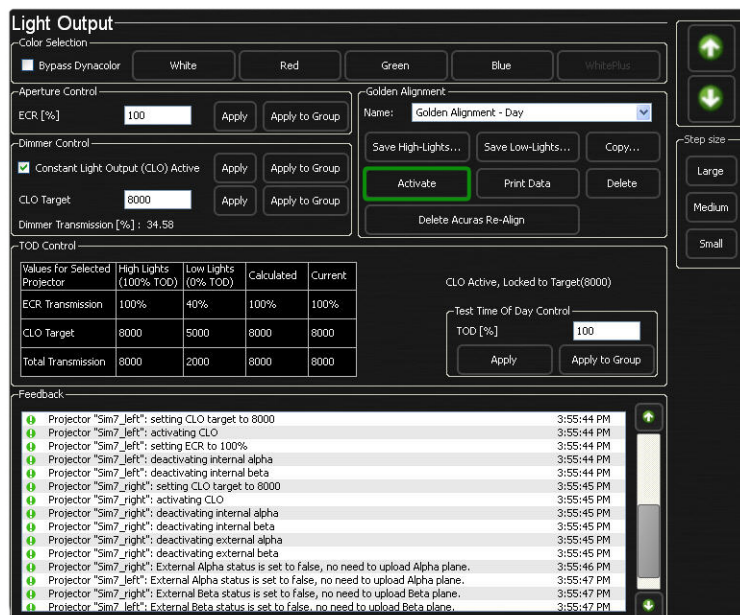


Image 10-26
Activating a golden alignment set

Note: Acuras realignment can only be executed when a Golden Alignment for which Acuras capture has been executed is activated. The active Golden Alignment is indicated at the top of the Acuras page.

3. Navigate to the *Acuras* page, and make either of the selections:
 - If you wish to calibrate more than one projector, select the desired projectors or select all projectors in that group.



Image 10-27
Selecting the desired projector(s)

- select group, if you wish to calibrate all projectors of this group.



Image 10-28
Group selected

4. Navigate to Realignment section and select the desired realignment settings. For reference see image 10-22, image 10-23, image 10-24, image 10-25.

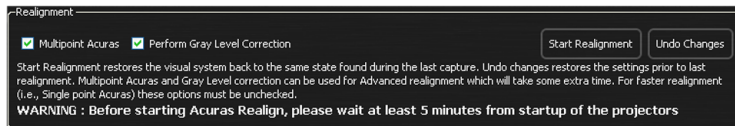


Image 10-29

Example: selecting the desired realignment setting

5. Press **Start Realignment**.

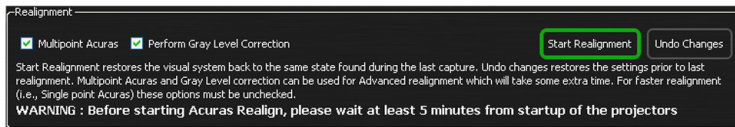


Image 10-30

Pressing the Start Realignment button

6. In the appearing *Acuras* dialog,

- press **Selected Group** to run the Acuras realignment process to all projectors of the selected group.
- press **Selected Projector** to run the Acuras realignment process to the selected projector(s) of the selected group.
- press **Cancel** to abort the Acuras realignment process.



Image 10-31

Acuras dialog

Note: The unselected projector(s) and the projector(s) on which the Acuras realignment process is not running go to pause state.

Note: If different head locations were used during the definition of Acuras positions, the user will be prompted to move the AutoAlignment Head to the corresponding physical locations during the Acuras realignment process

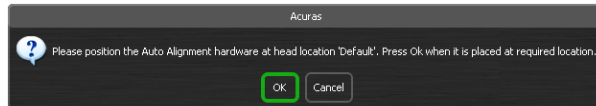


Image 10-32

It may take few minutes to complete the Acuras realignment operation for each projector.

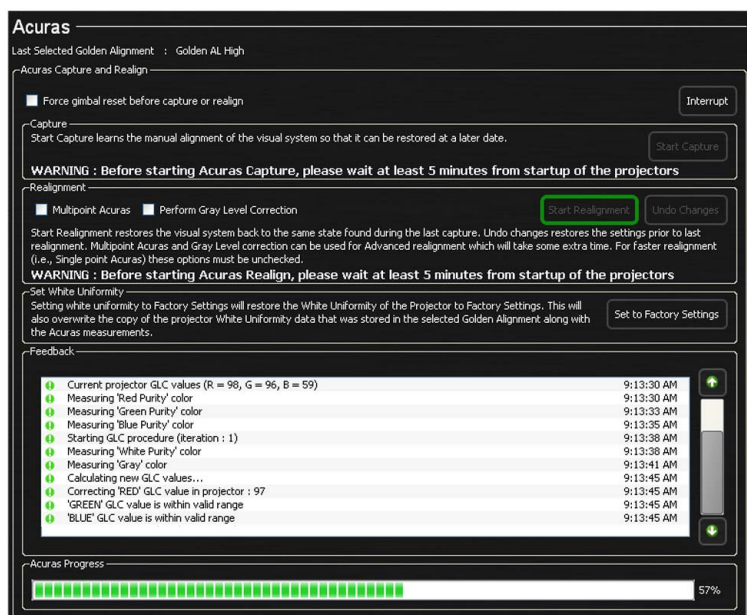


Image 10-33

Acuras realignment process in progress



Pressing the Interrupt button stops the Acuras realignment process. The Gimbal returns to its home position and the following confirmation dialog appears. The system will return to its previous situation and no data will be lost.

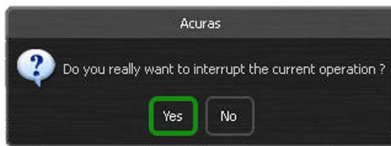


Image 10-34

10.5 Undoing an Acuras realignment

Undoing an Acuras realignment (Undo changes)

While performing an Acuras realignment, it can happen that the result is not satisfactory. Pressing **Undo changes** overrides the parameter changes saved during this Acuras realignment, ending up with the parameters of the previous realignment (or the initial parameters of the active Golden Alignment if no previous realignment parameters are available), on condition that no other operation has been performed since this last Acuras realignment.



An Undo changes feature can only be run once to return to the previous realignment. Multiple times running the Undo changes feature cannot return you any realignment data from the past.

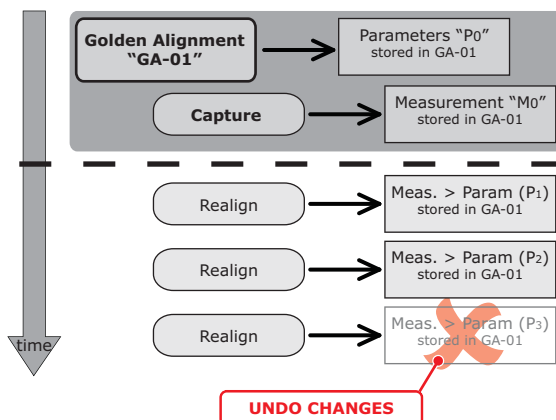


Image 10-35
Undo changes after Acuras realign

How to undo the Acuras Realign data?

1. Navigate to the *Acuras* page and make either of the selections:
 - If you wish to undo only on a selected set of projectors, select the desired projectors or select all projectors in that group.



Image 10-36
Selecting the desired projector(s)

- select group, if you wish to run undo for all projectors of this group.



Image 10-37
Group selected

2. Press **Undo Changes**



Image 10-38
Pressing the Undo Changes button

3. In the appearing **Acuras** dialog,

- press **Selected Group** to run the Acuras undo realignment process to all projectors of the selected group.
- press **Selected Projector** to run the Acuras undo realignment process to the selected projector(s) of the selected group.
- press **Cancel** to abort the Acuras undo realignment.

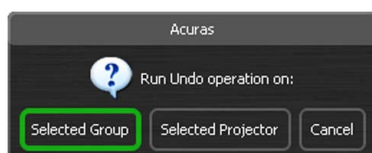


Image 10-39
Acuras dialog

A message appearing in the feedback section shows the progress information.

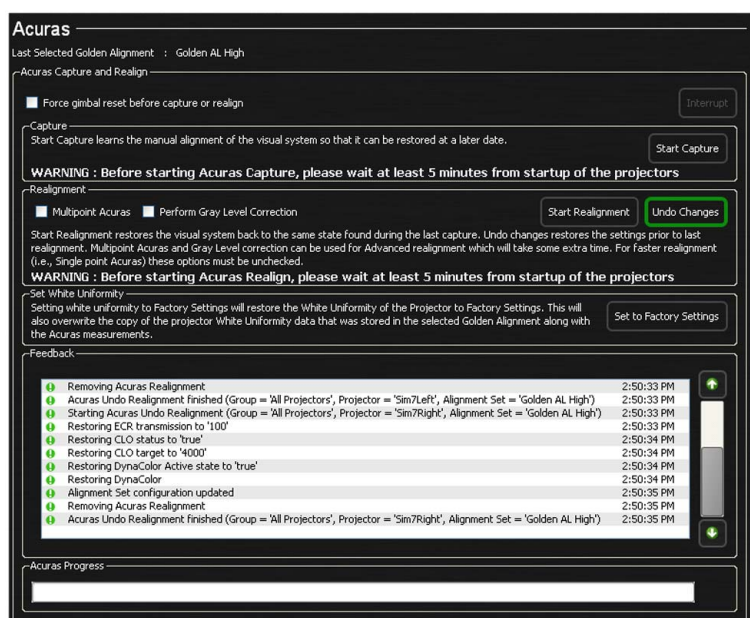


Image 10-40
Acuras undo realignment process completed



Pressing the **Interrupt** button stops the Acuras undo realignment process. The Gimbal returns to its home position and the following confirmation dialog appears. The system will return to its previous situation and no data will be lost.

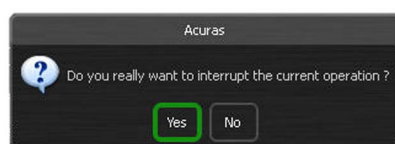


Image 10-41

10.6 Restoring the white uniformity factory settings

Restoring the white uniformity factory settings

In case of following fundamental changes in the display system (example: projector's displacement or projectors swap or white uniformity file of the projector is corrupted), the user can restore the projector's white uniformity factory settings on it. Pressing **Set to Factory Settings** reset the white uniformity of the selected projector(s) to its factory (original) settings.



It is always necessary to reset the white uniformity of the projector to its factory (original) settings, in case the white uniformity file of the projector is corrupted.



Restoring the white uniformity factory settings does not destroy any Acuras Capture data.

How to restore the white uniformity factory settings on the projector?

1. Navigate to *Light Output* page and activate the required Golden Alignment set.

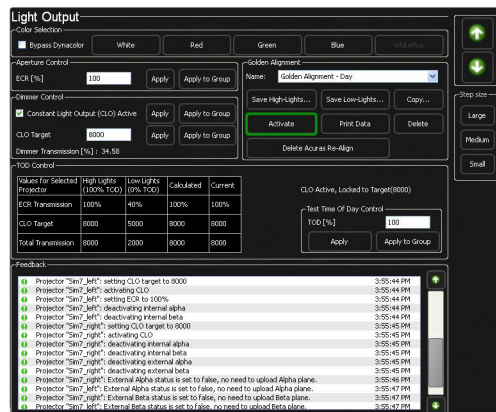


Image 10-42
Activating a Golden Alignment set

Note: Make sure that the selected Golden Alignment set has the set of the projector(s) on which the white uniformity factory settings need to be restored.

2. Navigate to the *Acuras* page and make either of the selections:

- If you wish to restore the factory white uniformity settings on the selected set of projectors, select the desired projectors or select all projectors in that group.



Image 10-43
Selecting the desired projector(s)

- select group, if you wish to restore the factory white uniformity settings on all projectors of this group.



Image 10-44
Group selected

3. Press **Set to Factory Settings**.

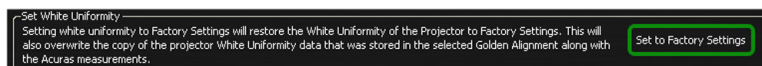


Image 10-45
Initiating the white uniformity process

4. In the appearing *White Uniformity* dialog,

- press **Selected Group** to reset the white uniformity of all projectors to its factory settings;
- press **Selected Projector** to reset the white uniformity of the selected projector(s) to its factory settings;
- press **Cancel** to abort the restoring white uniformity process.

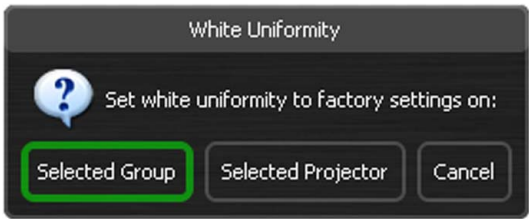


Image 10-46
White Uniformity dialog: Selecting an option

A message appearing in the feedback section shows the progress information.

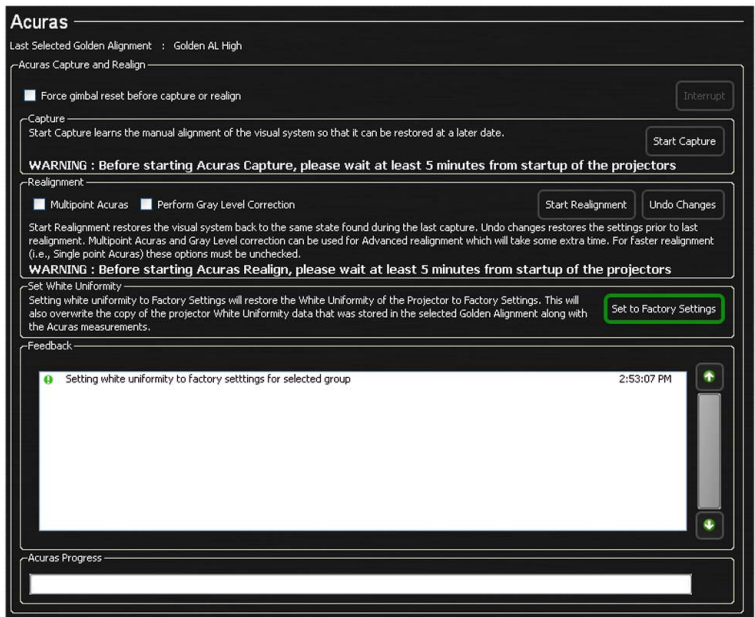


Image 10-47
White uniformity factory settings of all projectors restored successfully

10.7 Deleting Acuras realignment data

Deleting Acuras Realignment data (Delete Acuras Realign)

In case of a fundamental change in the display system (e.g. replacement of all lamps, replacement of a projector), we want to restore the system to its original brightness, colors and white uniformity. This means that we want to remove all realignment parameters and start from the parameter set as it was saved during the **Acuras Capture**.

Pressing **Delete Acuras Realign** deletes the parameters of all realignments that have been performed previously. This brings all involved Golden Alignment parameters back to its initial Acuras capture state (i.e. the Golden Alignment parameter set).

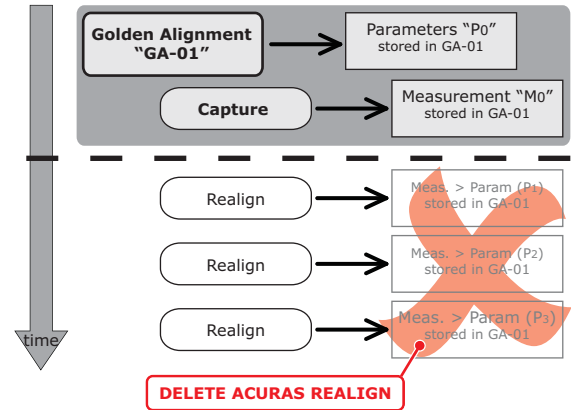


Image 10-48
Delete Acuras Realign

How to delete Acuras realignment data?

1. Select the group of the Golden Alignment for which the Acuras realignment data needs to be deleted.
2. Select a projector in that group.
3. Navigate to the *Light Output* page and select the desired Golden Alignment set from the drop down list.

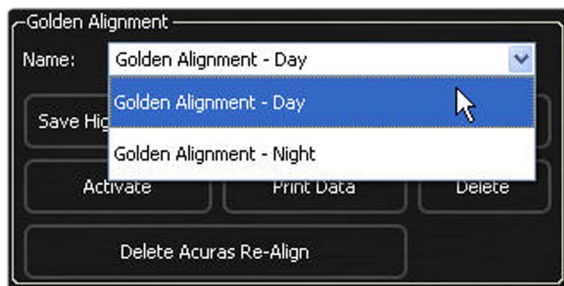


Image 10-49
Selecting the desired Golden Alignment set

4. Press **Delete Acuras Re-Align**

5. In the appearing *Delete Acuras Realign* press **Yes** to delete the Acuras realignment data of the selected Golden Alignment set.



Image 10-50

A message appearing in the feedback section shows the progress information.

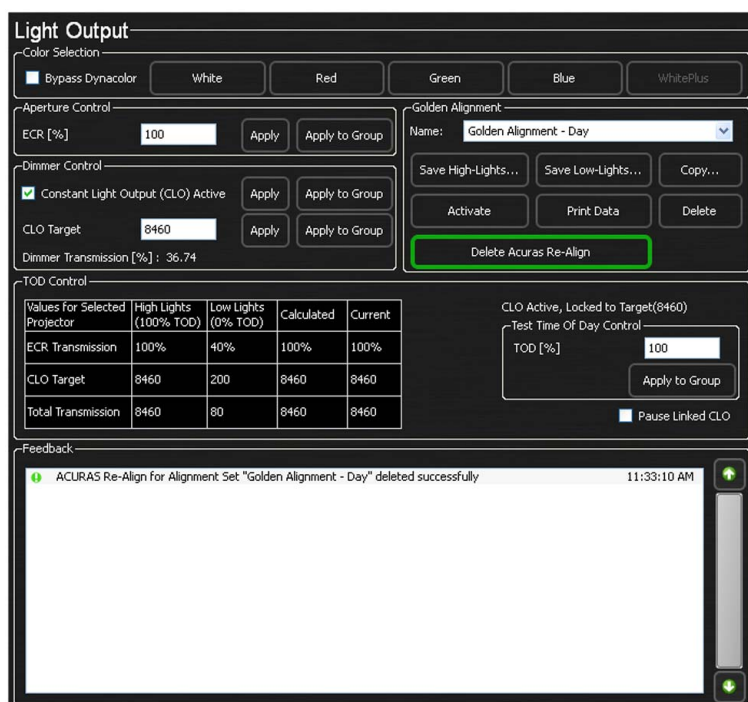


Image 10-51
Acuras realignment data deleted

11. OPERATING AUTOGEOMETRY: FACETED DISPLAY

About this chapter

The Faceted display AutoGeometry is available for systems having hard edged channel screens like multi facet screens where the physical screen boundaries can be used as reference points.

The goal of AutoGeometry is to determine the position of the screen corners in relation to the panel of the corresponding projector (X and Y projector pixel coordinates), where deviations between the captured and realigned state are returned to the Image Generator in order to make corrections. This chapter describes how to capture this data.

Overview

- AutoGeometry Capture



See “R59770566 — API Commands for XDS RACU Software” for the AutoGeometry commands that can be initiated through the API.



CAUTION: In order to use the camera functionality of the AutoAlignment Head, one should either boot the MCU and stay logged out of Windows or permanently stay logged in on Windows during usage of the AutoAlignment Head. A limitation of the camera driver makes it inaccessible after a Windows logoff event on the MCU. One should reboot or re-login to be able to use the camera functionality again after a Windows logoff.

11.1 AutoGeometry Capture

AutoGeometry Capture

The AutoGeometry Capture function retrieves the X and Y projector pixel coordinates of the visible corners of each display channel. During the capturing process, a sequence of patterns will be displayed, depending on the positioning data defined on the Positioning page.

AutoGeometry Capture is to be run only when the camera position is defined for each projector channel corner on the Positioning page. During Capturing process no stray light is allowed. All light on the screen other than the projector light must be eliminated. AutoGeometry Capture process can be run for both standard channels or a Head-Up Display projector.



Make sure that the AutoGeometry position is defined for each projector channel corner in the selected group whose coordinates need to be measured.



By default, the patterns on which the measurements for AutoGeometry are performed are generated in the projectors. It is however possible to use the AutoGeometry IG testpatterns through API commands. See “R59770566 — API Commands for XDS RACU Software”.



The best practice is to capture the AutoGeometry value for all the projectors in the selected group at once.

How to start the AutoGeometry capture process?

1. Open the AutoGeometry page.

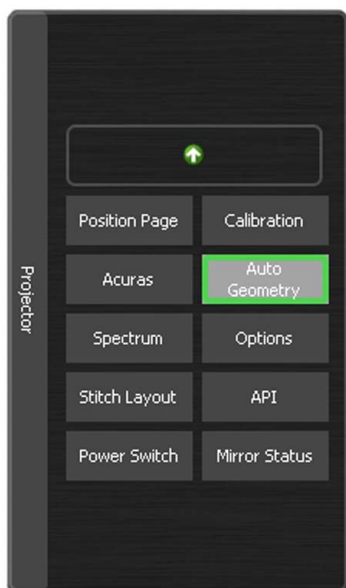


Image 11-1
Pressing the AutoGeometry button

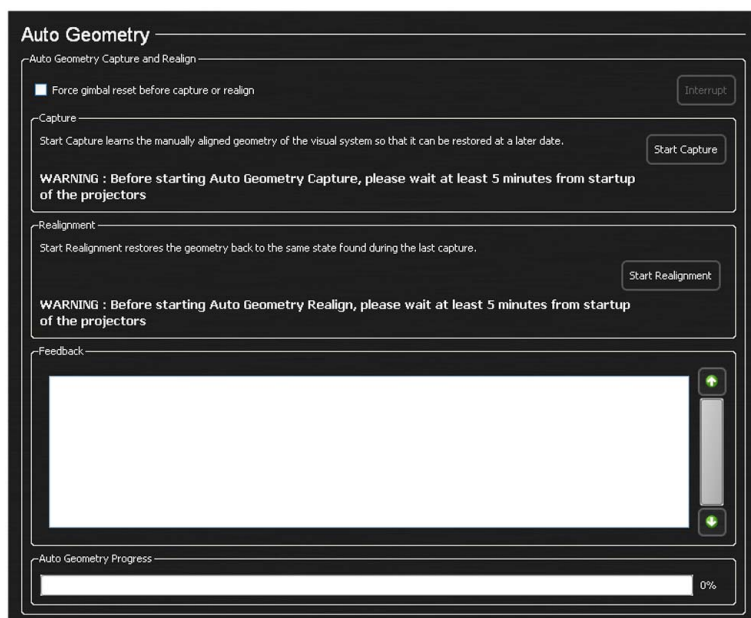


Image 11-2
AutoGeometry page is displayed

2. Select the desired projectors where you wish to run the AutoGeometry Capture process.

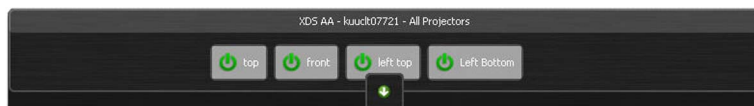


Image 11-3
All projectors selected

3. Use the Image Generator to project a white rectangle in the region of interest on the HUD and to project full black on the background channels.
Note: Only required in case a HUD AutoGeometry position was defined.
4. Press **Start Capture**



Image 11-4
Starting the AutoGeometry capture process

5. In the appearing *AutoGeometry* dialog do either of the following:

- press **Selected Group** to run the AutoGeometry capture process to all projectors of the selected group.
- press **Selected Projector** to run the AutoGeometry capture process to the selected projector(s) of the selected group.
- press **Cancel** to abort the AutoGeometry capture process.

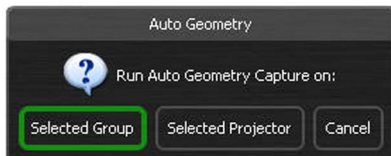


Image 11-5
AutoGeometry: dialog

Note: Pressing the **Interrupt** button will stop the AutoGeometry Capture process. The Gimbal will come back to its original position.

The following confirmation dialog will appear. The system will return to its previous situation and no data will be lost.

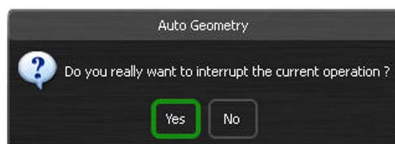


Image 11-6

Note: All the unselected projector(s) and the projector(s) on which the AutoGeometry capture process is not running go to pause state.

Note: If different head locations were used during the definition of AutoGeometry positions, the user will be prompted to move the AutoAlignment Head to the appropriate locations physically during the AutoGeometry capture process.

A message appearing in the feedback section shows the progress information. It may take several minutes to complete the AutoGeometry capture operation for each projector channel or for the HUD projector.

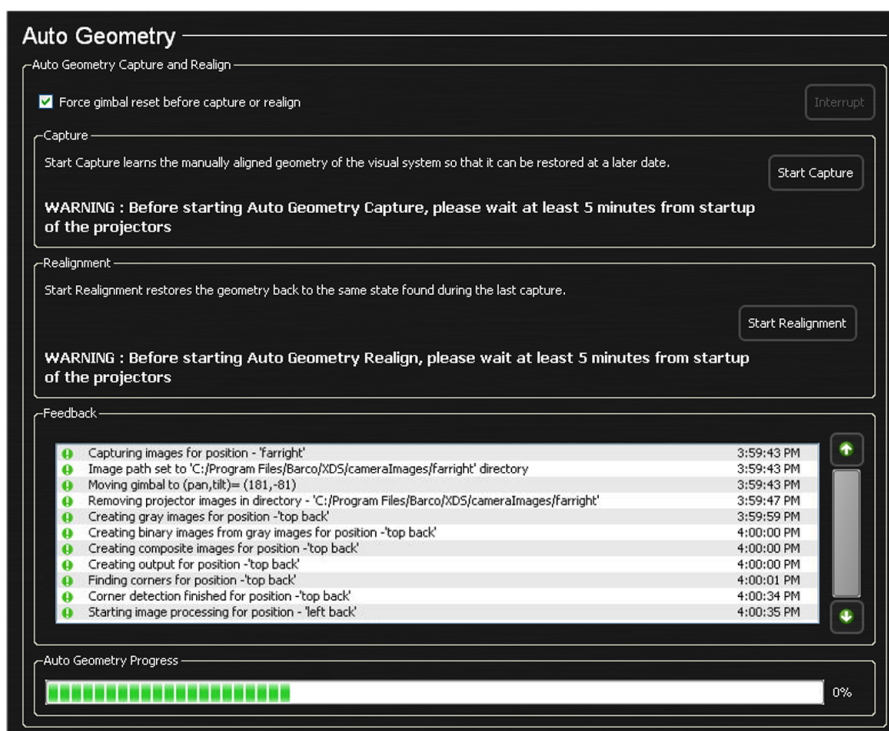


Image 11-7
AutoGeometry capture process in progress

12. OPERATING AUTOGEOMETRY: WARP DISPLAY

About this chapter

This chapter describes how to perform the Warp AutoGeometry Capture process. Next to that, performing Warp AutoGeometry Realignment and deleting a Warp Realignment data are discussed.

12.1 AutoGeometry Capture

AutoGeometry Capture

The capture process is run to make the XDS RACU learn the relative positions of the non-distorted AutoGeometry dots projected by the projector with respect to the reference dots from the LDATs or slide projector.

During the warp capturing process, series of AutoGeometry patterns having dots arranged in a linear manner (both horizontally and vertically) displayed by the projector and captured by the AutoAlignment Head camera.

The capture data obtained as a result of the warp capture process can be used in multiple warp realignment situations. It can be used to correct the geometrical errors occurs because of the projector replacement or mechanical shifts. Also, it can be used to correct the geometrical error introduced by the insertion of a blend plate in the projector(s) light path.

Three options are available for the user to generate the AutoGeometry dot pattern.

- Polaris;
- Projector;
- Image Generator.

Each option has its own prerequisite, which must be completed prior to starting the Warp AutoGeometry Capture process.

Prerequisite for Polaris

1. SimCAD file created for this display setup should be available;
2. Polaris software is installed on the master IG and on the slave IGs connected to their corresponding projectors in the display system;
3. Polaris Master PC is connected to the XDS RACU MCU through the network (LAN).
4. Polaris slave is launched on the slave IG of the projector for which the capture is to be executed;
5. Polaris Master is launched on the master IG.

Prerequisite for Projector

Make sure that external source(s) must be connected to the projector generating the AutoGeometry dot patterns.

Prerequisite for Image Generator

1. Make sure that application running on the Image Generator able to communicate with the XDS RACU software via XDS RACU API;
2. Make sure that application can draw AutoGeometry dot pattern on the Image Generator when received a request for it from the XDS RACU software.



Make sure that the AutoGeometry position is defined for each projector in the selected group where you wish to run the Warp AutoGeometry Capture.

How to start the Warp AutoGeometry Capture process?

1. Open the SimCAD file through the Barco Polaris Master window.
2. Navigate to *Options > Auto Alignment > Warp AutoGeometry* and do the following
 - a) check *Enable Warp AutoGeometry* check box.
 - b) select a pattern generator option from the Dot Pattern Generator drop down list as required.

Note: *Dot Pattern Generator is a password-protected item; a secret password is required!*

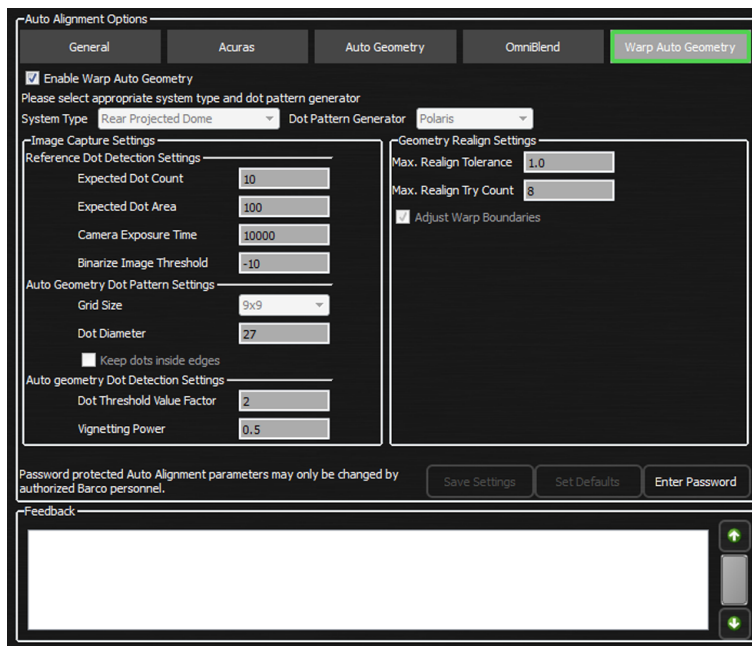


Image 12-1

3. Navigate to *Eyepoint* page and activate the eyepoint for which the warp capture process is to be performed.
4. Navigate to the *AutoGeometry* page and select the group where you wish to run the warp capture process.



Image 12-2
All projectors selected

5. Press **Start Capture**.

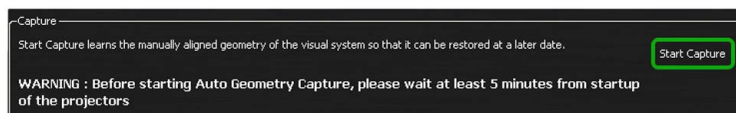


Image 12-3
Starting the capturing process

6. In the appearing *AutoGeometry* dialog do either of the following:
 - press **Selected Group** to run the warp capture process to all projectors of the selected group;
 - press **Cancel** to abort the capture process.

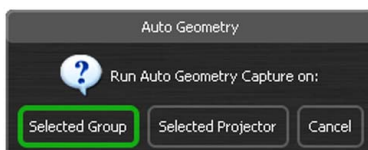


Image 12-4
Group selected for Warp Capturing

Note: The option **Selected Projector** is currently disabled. It might be re-enable in the future.

Note: If different head locations were used during the definition of AutoGeometry positions, the user will be prompted to move the AutoAlignment Head to the appropriate locations physically during the AutoGeometry capture process.

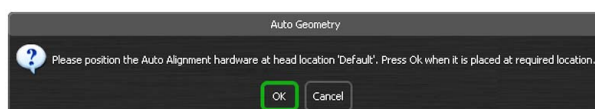


Image 12-5

7. Verify the AutoAlignment Head location and do either of the following:

- if at the correct location press **Yes** in the *AutoGeometry* dialog to proceed;
- if not at the correct location, then physically position the AutoAlignment Head to the correct location and then press **Yes** in the *AutoGeometry* dialog to proceed.

8. Wait until the warp capture process is completed, it may take several minutes to complete the process.

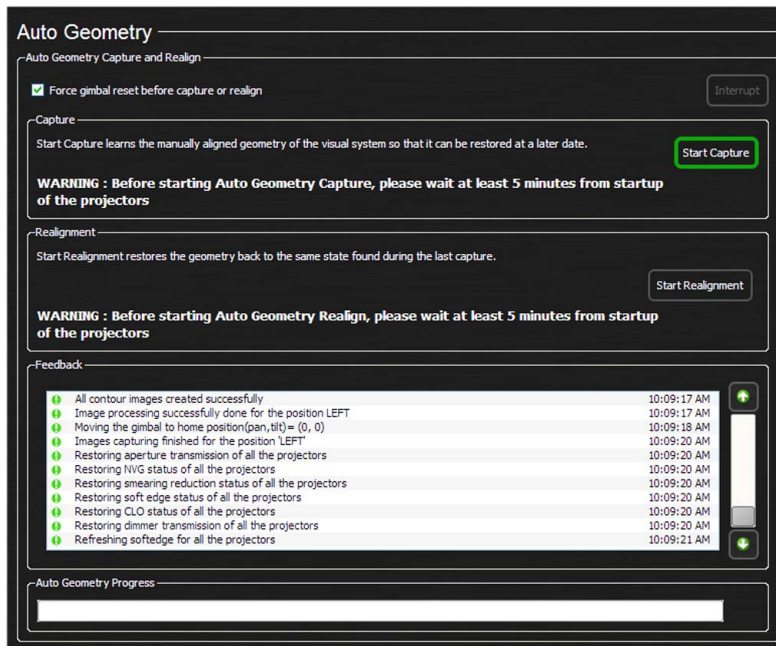


Image 12-6
Warp AutoGeometry Capture process completed

Note: Pressing the **Interrupt** button will stop the Warp AutoGeometry Capture process. The Gimbal will come back to its original position.

The following confirmation dialog will appear. The system will return to its previous situation and no data will be lost.

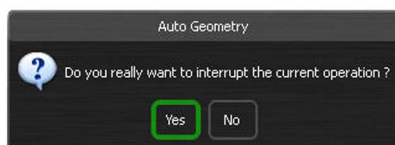


Image 12-7

12.2 AutoGeometry Realignment

AutoGeometry Realignment

In case of a fundamental change in the display system (e.g. replacement of a projector), the user wants to restore the system to its original geometry parameters. This can be done by restoring the geometry values saved during the Warp Capture.

Executing Warp Realignment realign the geometry values (in X and Y axis) of the projector(s) to the geometry values measured and saved at Capture time. The XDS RACU system automatically corrects the resulting inaccuracy in geometry by comparing the captured and realigned geometry values.

How to start the Warp AutoGeometry Realignment process?

1. Navigate to *Eyepoint* page and activate the eyepoint for which the warp realignment process is to be performed.
2. Navigate to the *AutoGeometry* page and select the desired projector(s) or group where you wish to run the warp realignment process.



Image 12-8
All projectors selected

3. Press **Start Realignment**.

12. Operating AutoGeometry: Warp display

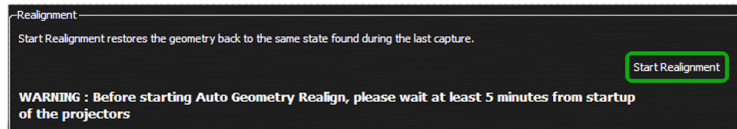


Image 12-9
Starting the realignment process

4. In the appearing *AutoGeometry* dialog do either of the following:

- press **Selected Group** to run the warp realignment process to all projectors of the selected group;
- press **Selected Projector** to run the warp realignment process to the selected projector(s) of the selected group;
- press **Cancel** to abort the realignment process.

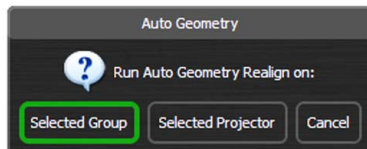


Image 12-10
Group selected for the realignment process

Note: If different head locations were used during the definition of AutoGeometry positions, the user will be prompted to move the AutoAlignment Head to the appropriate locations physically during the AutoGeometry capture process.

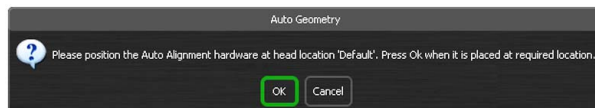


Image 12-11

5. Verify the AutoAlignment Head location and do either of the following:

- if at the correct location press **Yes** in the *AutoGeometry* dialog to proceed;
- if not at the correct location, then physically position the AutoAlignment Head to the correct location and then press **Yes** in the *AutoGeometry* dialog to proceed.

6. Wait until the warp realignment process is completed, it may take several minutes to complete the process.

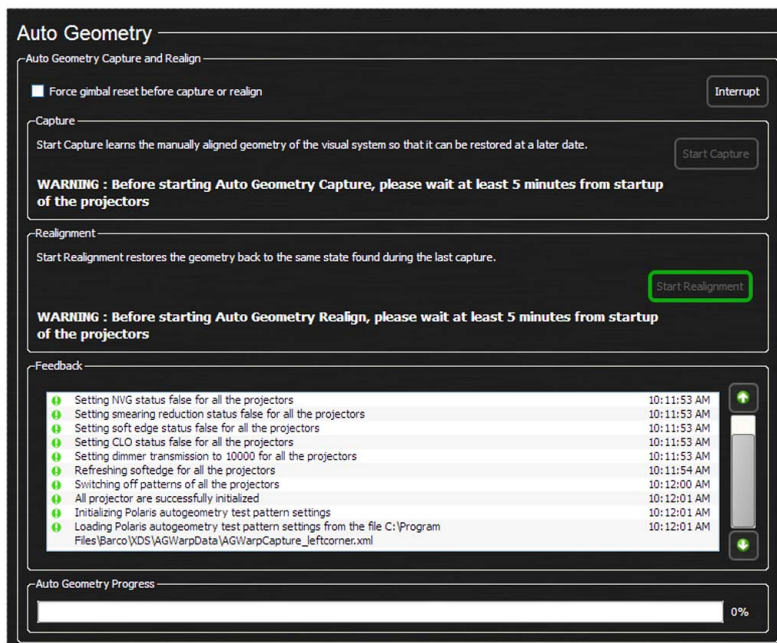


Image 12-12
Warp Realignment process is in progress

7. In the appearing *Confirm Warp Realignment* dialog, press **Yes** to store the warp realigned data on the projector(s) selected for the warp realignment.

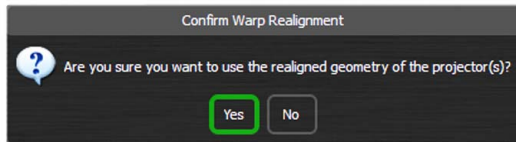


Image 12-13
Storing the realigned data on the projector(s)

A *Warp AutoGeometry* dialog appears, suggesting the user to take the full backup of this warp realigned data on MCU.

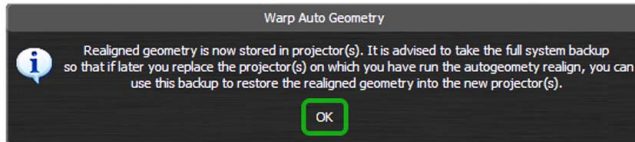


Image 12-14

Warp AutoGeometry Realignment process is completed. Automatically, the **Delete Realigned Data...** button appears on the AutoGeometry page.

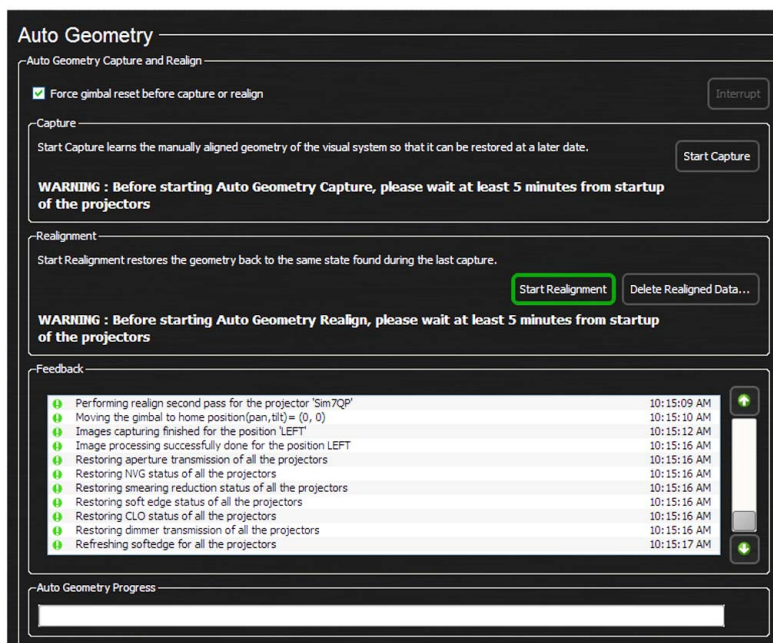


Image 12-15



Pressing the Interrupt button will stop the Warp AutoGeometry Realignment process. The Gimbal will come back to its original position.

The following confirmation dialog will appear. The system will return to its previous situation and no data will be lost.

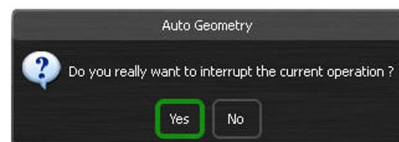


Image 12-16

12.3 Deleting Warp Realignment data

Deleting Warp Realignment data

While performing the Warp Realignment, it can happen that the result is not satisfactory (e.g. final image is not seamless). Pressing **Delete Realigned Data...** delete the warp realignment data of the selected eyepoint, ending up with geometry values measured and saved during the Capture time.



The **Delete Realigned Data...** button will appear automatically on the AutoGeometry page, whenever the first warp realignment data is saved on the projector(s) in a display system.

How to delete Warp Realignment data?

1. Navigate to the *AutoGeometry* page and select the desired projector(s) or group for which the realigned data needs to be deleted

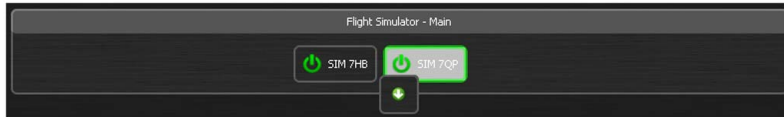


Image 12-17
Selecting a projector

2. Press **Delete Realigned Data...**

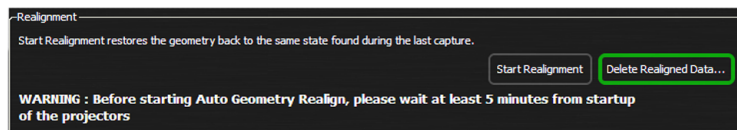


Image 12-18
Starting the deleting process

3. In the appearing *Delete Realign data* dialog do either of the following:
 - press **Selected Group** to delete the warp realignment data from all projectors of the selected group;
 - press **Selected Projector(s)** to delete the warp realignment data from the selected projector(s) of the selected group;
 - press **Cancel** to abort the warp realignment deletion process.

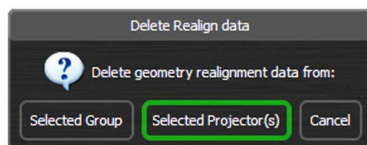


Image 12-19
Selecting the projector

4. In the appearing *Delete Realignment* dialog do the following:
 - select an eyepoint from the drop down list whose warp realignment data is to be deleted;

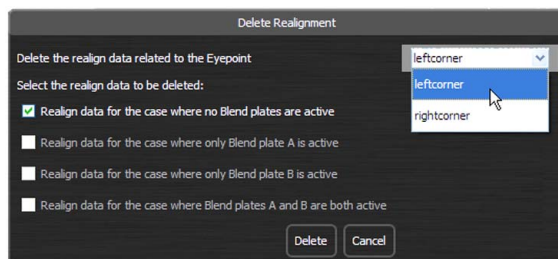


Image 12-20
Selecting an eyepoint and setting the check box

- select the realign data of this eyepoint to be deleted, by checking the its checkbox;
- press **Delete** to proceed.

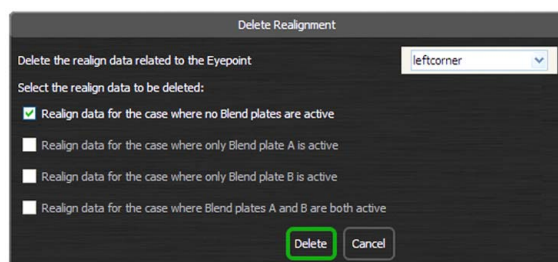


Image 12-21
Pressing the Delete button

5. In the appearing *Delete Realign data* dialog, press **Yes** to delete the selected realigned data of an eyepoint.

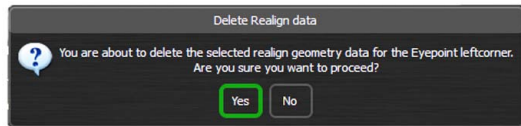


Image 12-22
Eyepoint is deleted

13. OPERATING OMNIBLEND

About this chapter

The OmniBlend feature is used to automatically align the brightness and colors of blend regions of a multiple channel system using the AutoAlignment Head.

In this chapter it is explained how to run the OmniBlend feature and what the options are.

Overview

- The OmniBlend process
- Displaying the OmniBlend page
- Starting OmniBlend process: projector basis
- Starting OmniBlend process: position basis
- Undoing an OmniBlend process

13.1 The OmniBlend process

About the OmniBlend process

OmniBlend is used to adjust brightness and colors in the blend regions to make them match the non blend areas of the displayed image, thus resulting in a seamless multiple channel image.

The OmniBlend process can be performed on two different bases:

- **OmniBlend position basis:** the OmniBlend process runs only on the projectors and camera orientations that are present in the selected OmniBlend positions.
- **Projector basis:** the OmniBlend process runs on the OmniBlend positions that include at least one of the selected projectors.

When the OmniBlend functionality is started in **automatic mode**, the camera is aimed at each defined OmniBlend position in turn. For each position, the results of brightness and color measurements are translated into an alpha plane (i.e. a TIFF bitmap including color and brightness corrections) for every projector that is included in that position.

At the end, the created alpha plane is uploaded to the projector, overwriting the current External alpha plane in the projector (if present).

If OmniBlend is started in **manual mode**, the operator can select the OmniBlend positions for which the OmniBlend process must be performed. See "Starting OmniBlend process: position basis", page 147.

As an option, the blend correction that is calculated during the OmniBlend process can be performed in two different levels:

- **Colored blending:** alpha planes are calculated for the red, green and blue channel per projector.
- **Grayscale blending:** per projector an alpha plane is calculated for the green channel only. This alpha plane is then used for the red and blue channel of that projector as well. This results in a faster alignment process.

The OmniBlend process can also be initiated through API commands : see "**R59770566 — API Commands for XDS RACU Software**".



Prior to starting the OmniBlend process, make sure that all blend regions are captured in at least one OmniBlend position. See "OmniBlend position", page 96.



CAUTION: In order to use the camera functionality of the AutoAlignment Head, one should either boot the MCU and stay logged out of Windows or permanently stay logged in on Windows during usage of the AutoAlignment Head. A limitation of the camera driver makes it inaccessible after a Windows logoff event on the MCU. One should reboot or re-login to be able to use the camera functionality again after a Windows logoff.

13.2 Displaying the OmniBlend page

How to display the OmniBlend page?

1. Open the main page of the XDS RACU user interface.
2. Select a projector (or group).
3. Navigate to *Projector > Alpha Beta Planes* and press it.

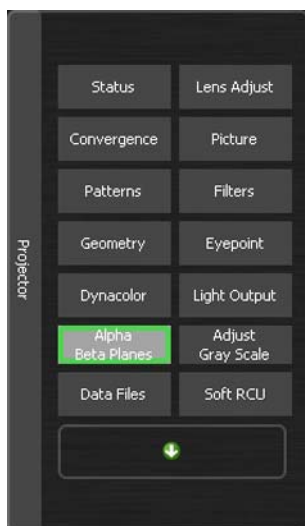


Image 13-1

The *Alpha Beta Plane* control page is displayed

4. Navigate to tab OmniBlend and press it.



Image 13-2

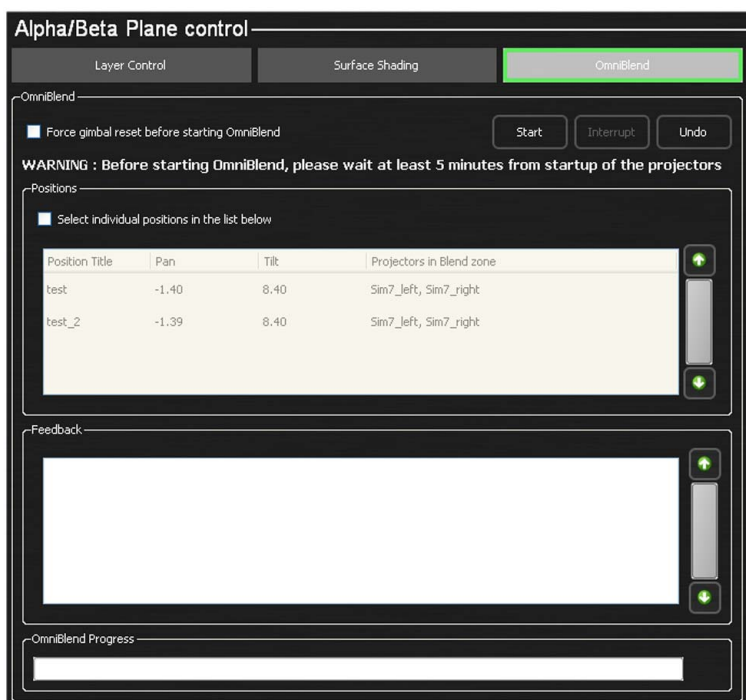


Image 13-3
OmniBlend page is displayed

13.3 Starting OmniBlend process: projector basis

How to start the OmniBlend process?

1. Open the *OmniBlend* page.
2. Select the projector(s) by doing either of the following:

- select the projectors on which you want to run the OmniBlend process.



Image 13-4
Selecting the projectors

- select a group if you wish to run the OmniBlend process on all projectors of this group.

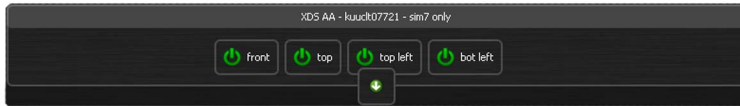


Image 13-5
Selecting the group

3. Press **Start**



Image 13-6
Starting the OmniBlend process

4. In the appearing OmniBlend dialog

- select the desired OmniBlend type: **Colored blending** or **Grayscale blending**.
- press **Selected Group** to run the OmniBlend process for all OmniBlend positions that include at least one projector of the selected group.
- press **Selected Projectors** to run the OmniBlend process for all OmniBlend positions that include at least one of the selected projectors.
- press **Cancel** to abort the OmniBlend process.



Image 13-7

Note: Pressing the **Interrupt** button stops the OmniBlend process. The Gimbal returns to its original position.

The following confirmation dialog appears. The system returns to its previous situation and no data is lost.

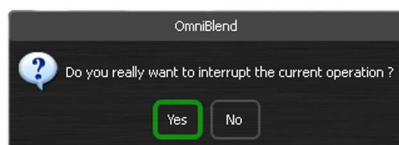


Image 13-8
Interrupting the OmniBlend process

Note: All the unselected projector(s) and the projector(s) present in the blend region position on which the OmniBlend process is not running go to pause state.

A message appearing in the feedback section shows the progress information. It may take several hours to complete the OmniBlend process depending on the number of projectors selected.

13.4 Starting OmniBlend process: position basis

How to start the OmniBlend process?

1. Open the *OmniBlend* page.
2. Set the *Select individual positions in the list below* checkbox to activate the position selection.



Image 13-9
Activating the position selection section

3. Select the OmniBlend position(s) where you wish to run the OmniBlend process.

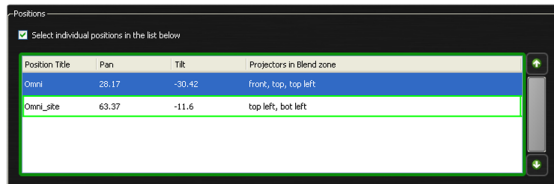


Image 13-10
Selecting the position

4. Press **Start**



Image 13-11
Starting the OmniBlend process

5. In the appearing OmniBlend dialog:
 - select the desired OmniBlend type: **Colored blending** or **Grayscale blending**.
 - press **Selected positions** to run the OmniBlend process for the selected OmniBlend positions.
 - press **Cancel** to abort the OmniBlend process.



Image 13-12

Note: Pressing the **Interrupt** button stops the OmniBlend process. The Gimbal returns to its original position.

The following confirmation dialog appears. The system returns to its previous situation and no data is lost.



Image 13-13
Interrupting the OmniBlend process

Note: All projectors that are not part of any of the selected OmniBlend positions go to pause state.

Note: If OmniBlend positions were defined for different head locations, the user is prompted to physically move the *AutoAlignment Head* to the appropriate locations during the OmniBlend process.

A message appearing in the feedback section shows the progress information. It may take several hours to complete the OmniBlend process depending on the number of positions selected.

13.5 Undoing an OmniBlend process

Undoing an OmniBlend process (Undo changes)

If the result of an OmniBlend process turns out to be poor for one or more blend regions (e.g. due to ambient light), the last saved alpha plane on the concerned projector(s) can be restored if no other action was performed in the meantime (e.g. other projectors selected, other group selected).



This Undo feature can only restore the last alpha plane. It is not possible to retrieve previously saved alpha planes, unless an existing backup is manually restored through the Data Files page of the XDS RACU user interface.

How to undo the results of an OmniBlend process?

1. On the *OmniBlend* page make either of the selections:

- select one or more projectors for which you want to undo the results of the OmniBlend process,



Image 13-14
Selecting the projectors

- select a group, if you wish to run undo for all projectors of that group,

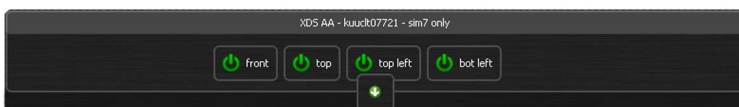


Image 13-15
Selecting the group

- select a position, if you wish to run undo on the projectors present in a selection of OmniBlend positions

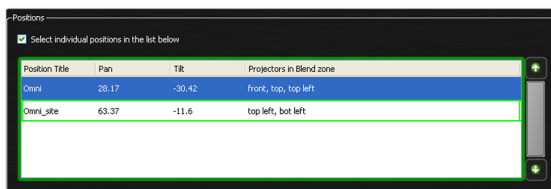


Image 13-16
Selecting the position

Note: To select a position, you need to set the *Select individual positions in the list below* checkbox.

2. Press **Undo**



Image 13-17
Pressing Undo button

3. In the appearing OmniBlend dialog, press **Yes** to start the OmniBlend undo process.

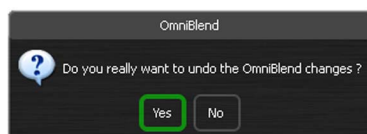


Image 13-18
Starting the OmniBlend undo process

A message appearing in the feedback section shows the progress information. It may take several hours to complete the OmniBlend undo process depending on the options selected.

14. REPLACING DEVICES

Introduction

The Replace Device tab has two sub tabs: General and Auto Alignment and each tab has three sections. The General tab has following sections: Projector, Motorized Blend Plate and IP Link Power Switch Device. The Auto Alignment tab has following sections: Camera, Spectrometer and Laser.

The procedures below describes how to replace a Camera, Spectrometer and Laser with their new ones.

The screenshot shows the 'Replace Device Options' dialog box with the 'General' tab selected. It contains three sections: 'Camera', 'Spectrometer', and 'Laser'. Each section has a dropdown menu to select the device to be replaced and a text field to enter the serial ID of the new device, with a 'Replace' button next to each.

Image 14-1



For projector, motorized blend plate and IP Link Power Switch Device replacement see the XDS RACU User guide: R59770508.

Overview

- Replacing a camera
- Replacing a spectrometer
- Replacing a laser

14.1 Replacing a camera

How to replace a Camera?

1. In the *Options* page, navigate to *Replace Device > Camera*.

The screenshot shows the 'Camera' section of the 'Replace Device Options' dialog box. It has a dropdown menu with '1630309529' selected and a text field for the new camera's serial ID.

Image 14-2
Section: Camera

2. Select the camera to be replaced from the drop down list.

The screenshot shows the 'Camera' section of the 'Replace Device Options' dialog box. The dropdown menu is open, showing a list of camera serial IDs, with '1630309529' highlighted.

Image 14-3
Selecting old camera

14. Replacing devices

3. Enter the serial ID of the new camera.

Note: Serial number of the camera can be read from the XDS RACU Server Console or from the label attached to the bottom of the camera.

Serial number of the camera can also be read from the Select the camera to be replaced drop down list (image 14-3). XDS RACU automatically assigns an ID to each connected camera. The ID has format **cameraX**, where X is a digit that is increased by one for every newly connected camera. The last connected camera has the highest digit in its ID.

4. Press the **Replace** button to confirm the replacement.

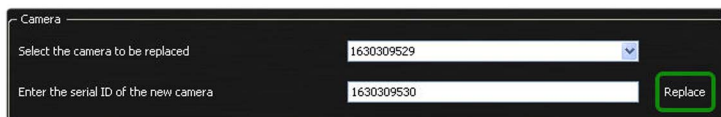


Image 14-4
Confirming the camera replacement

A message appearing in the feedback section shows the progress information.

14.2 Replacing a spectrometer

How to replace a Spectrometer?

1. In the *Options* page, navigate to *Replace Device > Spectrometer*.



Image 14-5
Section: Spectrometer

2. Select the spectrometer to be replaced from the drop down list.




Image 14-6
Selecting old spectrometer

3. Enter the serial ID of the new spectrometer.

Note: Serial number of the spectrometer can be read from the XDS RACU Server Console or from the label attached to the device.

Serial number of the spectrometer can be also read from the Select the spectrometer to be replaced drop down list (image 14-6). XDS RACU automatically assigns an ID to each connected spectrometer. The ID has format **spectrometerX**, where X is a digit that is increased by one for every newly connected spectrometer. The last connected spectrometer has the highest digit in its ID.

4. Press the **Replace** button to confirm the replacement.



Image 14-7
Confirming the spectrometer replacement

A message appearing in the feedback section shows the progress information.

14.3 Replacing a laser

How to replace a Laser?

1. In the *Options* page, navigate to *Replace Device > Laser*.



The screenshot shows a web interface titled 'Laser'. It has two input fields: 'Select the laser to be replaced' with a dropdown menu showing 'FTSM4I4M', and 'Enter the serial ID of the new laser' with an empty text box. A 'Replace' button is located to the right of the second field.

Image 14-8
Section: Laser

2. Select the laser to be replaced from the drop down list.



This screenshot is similar to the previous one, but a blue highlight and a mouse cursor are visible over the 'FTSM4I4M' option in the dropdown menu, indicating it is being selected.

Image 14-9
Selecting old laser

3. Enter the serial ID of the new laser.

Note: Serial number of the laser can be read from the XDS RACU Server Console or from the label attached to the device.

Serial number of the laser can also be read from the Select the laser to be replaced drop down list (image 14-9). XDS RACU automatically assigns an ID to each connected laser. The ID has format **laserX**, where X is a digit that is increased by one for every newly connected laser. The last connected laser has the highest digit in its ID.

4. Press the **Replace** button to confirm the replacement.



This screenshot shows the 'Replace' button highlighted with a green rectangular box, indicating it should be clicked to confirm the replacement.

Image 14-10
Confirming the laser replacement

A message appearing in the feedback section shows the progress information.

15. TROUBLESHOOTING

Introduction

This troubleshooting guide will be a help to determine possible cause(s) of an issue in case it occurs. Basic troubleshooting can be done by a trained and qualified operator or a technician.

Overview

- Empty display list
- AutoAlignment Head
- LEX Unit
- Camera
- Laser pointer
- Spectrometer
- Gimbal
- USB device not detected

15.1 Empty display list

Empty display list

If you start the XDS RACU client software on your eRACU, a *Display* dialog pops up, showing the displays that are detected in the local network. If this display list is empty, first you need to check the network settings. If not successful, you can try to clear the local DNS cache of the Windows session running on the MCU.

Checking the network settings

Make sure that the correct network settings are applied in both the MCU and the eRACU Dashboard application. See concerning chapter: *Setting up the network interface*.

Cleaning the local DNS cache

1. In Windows on the MCU, go to *Start > Run*

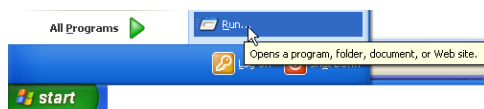


Image 15-1
Windows > Start > Run

2. In the *Run* dialog, enter the command `cmd` and click **OK**

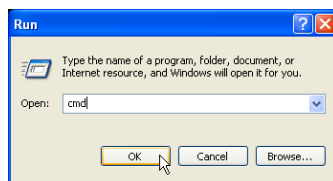


Image 15-2
Run > Cmd

3. In the Windows *Command* window, after the prompt enter `ipconfig /flushdns` and click **Enter**

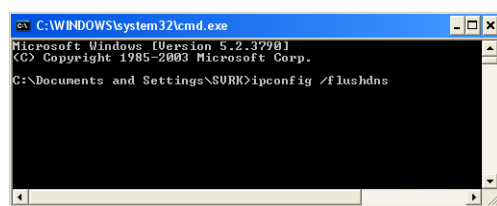


Image 15-3
Ipconfig /flushdns

4. A confirmation appears: close the Windows *Command* window.

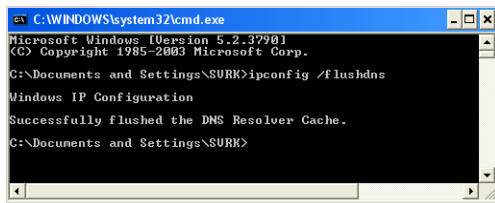


Image 15-4
DNS cache flushed

15.2 AutoAlignment Head

AutoAlignment Head not powered

In the troubleshooting steps below, *AutoAlignment Head not powered* is a possible cause of issues that is mentioned a multiple times. The table below lists the possible causes (and actions) that can lead to a AutoAlignment Head which is not powered.

Possible cause	Action
Emergency stop is engaged	<ol style="list-style-type: none"> 1. Release the Emergency stop 2. Optionally, stop and restart the XDS RACU server on the MCU
Power cord unplugged	<ol style="list-style-type: none"> 1. Plug in the power cord in the AutoAlignment Head and in the wall outlet 2. Switch the Main switch of the AutoAlignment Head to ON 3. Optionally, stop and restart the XDS RACU server on the MCU
Main switch Is OFF	<ol style="list-style-type: none"> 1. Switch the Main switch of the AutoAlignment Head to ON 2. Optionally, stop and restart the XDS RACU server on the MCU
No Mains power	Check the Mains power supply or the Power Distribution Unit

15.3 LEX Unit

Troubleshooting LED's

Two LED's are available on the LEX unit:

- BLUE LED: **ON** if this unit is powered
- GREEN LED: **ON** if the corresponding remote unit in the AutoAlignment Head has been detected

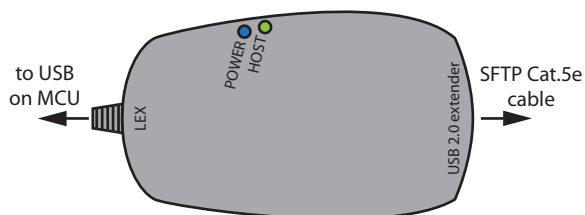


Image 15-5
LEX unit: LED's

Both LED's should be ON to guarantee proper working of the LEX unit. If at least one of the LED's is off, try to repair it by performing the following actions

1. Check the USB connection between LEX unit and MCU
 - Plug and reconnect the USB connector of the LEX unit from/to the MCU
 - On the AutoAlignment Head, do a power cycle
2. Try to find out if the USB port on the MCU is failing
 - Plug in the USB connector of the LEX unit into another USB port on the MCU
 - On the AutoAlignment Head, do a power cycle
3. Check the RJ45 connections of the SFTP Cat5e cable
 - Unplug and reconnect both RJ45 connectors of the SFTP Cat.5e cable between the AutoAlignment Head and the LEX unit

15.4 Camera



Since the laser pointer is installed next to the spectrometer, there is a small parallax error between the laser pointer and the spectrometer Field of View, depending on the distance to these devices.

Camera settings

To guarantee proper working, the camera settings should never be changed! The default settings of the various selection switches are listed below:

- Power switch: **ON**
- Rotary dial: **M**
- Focus selection switch on the camera lens: **MF**

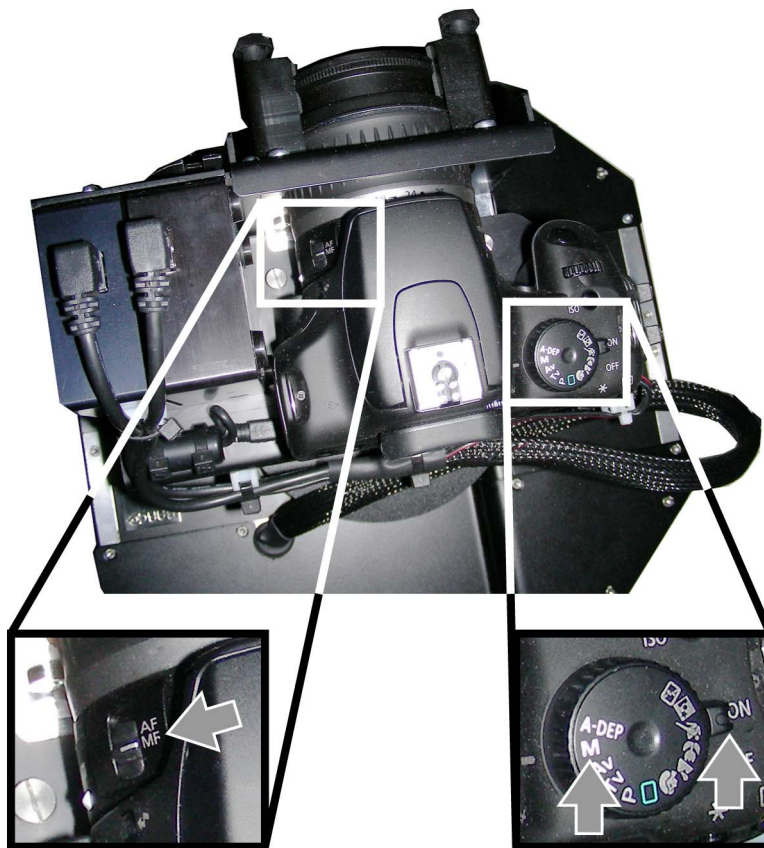


Image 15-6
Camera settings

No image from the camera

No *Live view from current selected camera* is visible on the *Position page* of the XDS RACU user interface

Possible cause	Action
Lens cap on the Camera lens	Remove the lens cap

15. Troubleshooting

Possible cause	Action
AutoAlignment Head not powered	See "AutoAlignment Head", page 156
Camera not well connected	Plug in the USB cable on the Camera. See image 15-7
Camera switched off	Switch the main switch to ON
Rotary dial of the Camera in wrong position	Set the rotary dial of the Camera to "M"
Bad communication	Check LEDs on the LEX unit (see concerning topic) Plug in both RJ45 connectors of the SFTP Cat.5e cable Plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head Remove any HUB from the line AutoAlignment Head — MCU
Camera not detected (see the procedure below to check if the camera is detected)	Unplug and plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head Stop and restart XDS RACU Server on the MCU
Wrong calibration files	Upload the correct Camera calibration file (<filename>.xml) to the MCU.

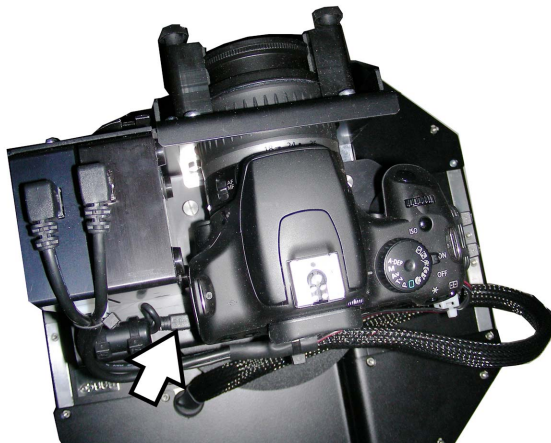


Image 15-7
Camera: USB cable

Image from the camera is not in focus

The *Live view from current selected camera* image is visible on the *Position* page of the XDS RACU user interface, but it is out of focus

Possible cause	Action
Bad focus alignment	Adjust the focus ring. If the distance to different parts of the screen is not the same, set the average focus setting
Wrong lens focus setting	Set the camera lens to "MF"

Error message: Camera can not be used after system logoff

In order to use the camera functionality in AutoAlignment, one should boot the MCU and stay logged out of Windows or permanently stay logged in on Windows during usage of AutoAlignment. A limitation of the camera driver makes it inaccessible after a Windows logoff event and an error message will appear: **Camera can not be used after system logoff**. One should reboot or re-login on Windows to be able to use the camera functionality again.

Checking if the camera has been detected

1. On the MCU, open the Windows browser (e.g. click **My Computer**)
2. Check if Canon EOS1000 is available

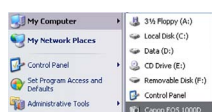


Image 15-8
Camera: detected by Windows OS

15.5 Laser pointer

No laser dot can be seen

Possible cause	Action
Laser pointer not activated	Switch on the laser pointer via the XDS RACU user interface
Laser aperture is covered	Remove the object covering the laser aperture
Laser dot is pointing off the screen	Aim the laser dot on a location on the screen
Laser beam blocked	Remove blocking objects
Laser pointer not well connected	Plug in the USB cable on the Laser pointer. See image 15-9 and image 15-10 below.
AutoAlignment Head not powered	See <i>concerning topic above</i>
Bad communication	Check LEDs on the LEX unit (see concerning topic) Plug in both RJ45 connectors of the SFTP Cat.5e cable Plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head Remove any HUB from the line AutoAlignment Head — MCU
Laser pointer not detected (see the procedure below to check if the camera is detected)	Unplug and plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head Stop and restart XDS RACU Server on the MCU

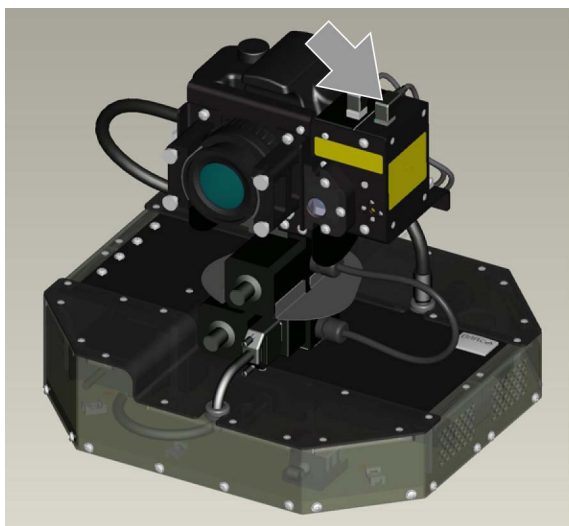


Image 15-9
Laser pointer: USB cable (AutoAlignment Head standard version)



Image 15-10
Laser pointer: USB cable (AutoAlignment Head rugged version)

Checking if the laser pointer has been detected

1. On the MCU, browse to *Start > Administrative Tools > Devices*
2. In the list, check if *USB Serial Converter* is present

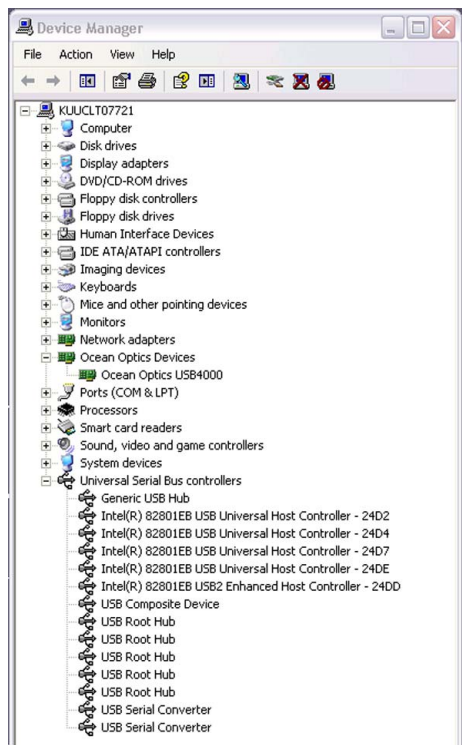


Image 15-11
Laser pointer: detected by Windows OS

3. Right-click the item *USB Serial Converter* and select **Properties**



Image 15-12
Laser pointer: USB properties

Next to *Location*, you can verify that this USB port belongs to **Pointer Control**, which indicates the detection of the laser pointer by Windows OS

15.6 Spectrometer



Since the laser pointer is installed next to the spectrometer, there will be a small parallax error between the laser pointer and the spectrometer Field of View, depending on the distance to these devices.

Spectrometer is not performing any measurement

Possible cause	Action
Spectrometer not well connected	Plug in the USB cable on the Spectrometer. See image 15-13 and image 15-14 below.

Possible cause	Action
AutoAlignment Head not powered	See concerning topic above
xRACU Classic or xRACU Lite software is installed on the MCU	Uninstall xRACU Classic and xRACU Lite software
Bad communication	<p>Check LEDs on the LEX unit (see concerning topic)</p> <p>Plug in both RJ45 connectors of the SFTP Cat.5e cable</p> <p>Plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head</p> <p>Remove any HUB from the line AutoAlignment Head — MCU</p>
Spectrometer not detected (see the procedure below to check if the camera is detected)	<p>Unplug and plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head</p> <p>Stop and restart XDS RACU Server on the MCU</p>
Wrong calibration files	Upload the correct Spectrometer calibration file (<filename>.cal) to the MCU

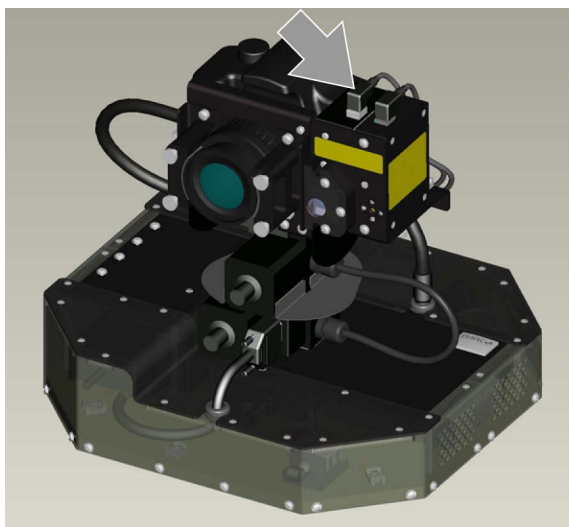


Image 15-13
Spectrometer: USB cable (AutoAlignment Head standard version)

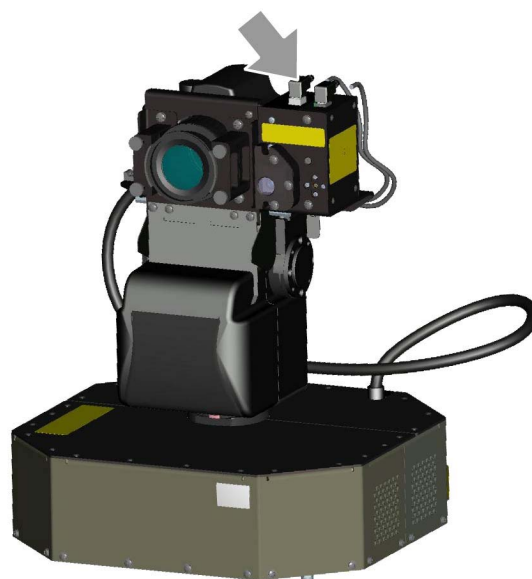


Image 15-14
Spectrometer: USB cable (AutoAlignment Head rugged version)

Wrong measurements

Possible cause	Action
Ambient light conditions	Create a fully dark environment
Spectrometer aperture covered	Remove the object covering the Spectrometer aperture

Checking if the spectrometer has been detected

1. On the MCU, browse to *Start > Administrative Tools > Devices*
2. In the list, check if *Ocean Optics Devices > Ocean Optics USB4000* is present

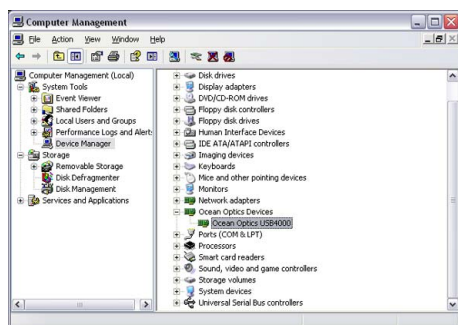


Image 15-15
Spectrometer: detected by Windows OS

15.7 Gimbal

No pan or tilt movement

The Gimbal does not perform any movement (i.e. pan and tilt), or one of the movements is not functioning

Possible cause	Action
Shipping bracket is still installed	Remove the shipping bracket
Gimbal is mechanically blocked	Remove any blocking object
Gimbal is not well connected	Plug in the Gimbal connector. See image 15-16 and image 15-17 below.
AutoAlignment Head not powered	See <i>concerning topic above</i>
Bad communication	Check LEDs on the LEX unit (see <i>concerning topic</i>) Plug in both RJ45 connectors of the SFTP Cat.5e cable Plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head Remove any HUB from the line AutoAlignment Head — MCU
Gimbal not detected (see the procedure below to check if the camera is detected)	Unplug and plug in the USB connector of the LEX unit to the MCU USB port and perform a power cycle on the AutoAlignment Head Stop and restart XDS RACU Server on the MCU

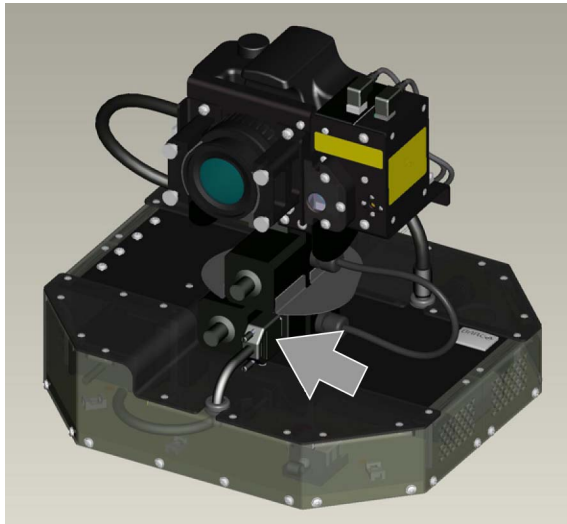


Image 15-16
Gimbal connector: AutoAlignment Head standard version



Image 15-17
Gimbal connector: AutoAlignment Head standard version

Wrong pan or tilt positions

The Gimbal positions are not correct

Possible cause	Action
Gimbal calibration was skipped after it had been switched OFF and ON again	Calibrate the Gimbal through the XDS RACU user interface (<i>Position</i> page)
AutoAlignment Head has been swapped	Define the new Head in the XDS RACU user interface (<i>Options</i> page) Calibrate the Gimbal through the XDS RACU user interface (<i>Position</i> page) Redo all positioning operations in the XDS RACU user interface (<i>Position</i> page)
AutoAlignment Head position and / or orientation changed	Restore the original position/orientation or redo all positioning operations in the XDS RACU user interface (<i>Positioning</i> page)

Checking if the Gimbal has been detected

1. On the MCU, browse to *Start > Administrative Tools > Devices*

2. In the list, check if *USB Serial Converter* is present

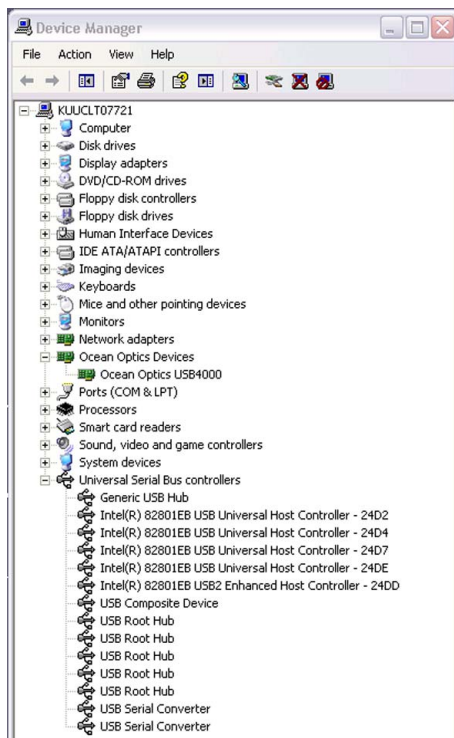


Image 15-18

Laser pointer: detected by Windows OS

3. Right-click the item *USB Serial Converter* and select **Properties**

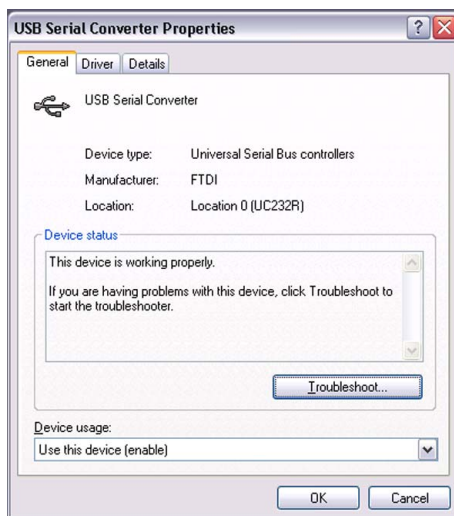


Image 15-19

Gimbal: USB properties

Next to *Location*, the string **UC232R** indicates the detection of the Gimbal by Windows OS

15.8 USB device not detected

USB device not detected

If any USB device (e.g. Blend plate motorization, Spectrometer, Laser pointer) is not detected, install Windows XP Service Pack 3.

A. CE DECLARATION

A.1 CE declaration

CE declaration

The CE declaration for both standard and rugged AutoAlignment Head Gen II can be found on the following pages.



MANUFACTURERS EC DECLARATION OF CONFORMITY

Kortrijk, 29 August 2013

Manufacturer Identification:

Legal Name : Barco NV
Address : President Kennedypark 35
8500 Kortrijk
Belgium

Representative : Jan Willem Brands
Function : Chief Technology Officer

Product Identification:

Product : Auto Alignment Interface
Brand : Barco
Model : **MES ACURAS HEAD**

Declaration:

Provided that it is installed, maintained and used in the application for which it is made, with respect of the professional practices, relevant installation codes and manufacturer's instructions:

*We hereby declare, under our sole responsibility, that the above referenced product complies with the essential requirements of Council Directives
2006/42/EC (MD), 2004/108/EC (EMC), 2006/95/EC (LVD) and 2011/65/EC (RoHS)*

European harmonised standards applied:

EMC Emission: EN 55022 (2010)
EN 61000-3-2 (2006) + A1 (2009) + A2 (2009)
EN 61000-3-3 (2008)
Immunity: EN 55024 (2010)

Product safety: EN 60950-1 (2006) + A11 (2009) + A1 (2010) + A12 (2011)

Machine Directive: EN ISO 12100 (2010)

RoHS: EN 50581 (2012)

Signature of manufacturer representative:

Jan Willem Brands



MANUFACTURERS EC DECLARATION OF CONFORMITY

Kortrijk, 29 August 2013

Manufacturer Identification:

Legal Name : Barco NV
Address : President Kennedypark 35
8500 Kortrijk
Belgium

Representative : Jan Willem Brands
Function : Chief Technology Officer

Product Identification:

Product : Auto Alignment Interface
Brand : Barco
Model : **MES ACURAS HEAD RUGGED**

Declaration:

Provided that it is installed, maintained and used in the application for which it is made, with respect of the professional practices, relevant installation codes and manufacturer's instructions:

*We hereby declare, under our sole responsibility, that the above referenced product complies with the essential requirements of Council Directives
2006/42/EC (MD), 2004/108/EC (EMC), 2006/95/EC (LVD) and 2011/65/EC (RoHS)*

European harmonised standards applied:

EMC Emission: EN 55022 (2010)
EN 61000-3-2 (2006) + A1 (2009) + A2 (2009)
EN 61000-3-3 (2008)
Immunity: EN 55024 (2010)

Product safety: EN 60950-1 (2006) + A11 (2009) + A1 (2010) + A12 (2011)

Machine Directive: EN ISO 12100 (2010)

RoHS: EN 50581 (2012)

Signature of manufacturer representative:

Jan Willem Brands

INDEX

A

- About 5
 - manual 5
- access 28
- acuras 131
 - realignment data 131
 - deleting 131
- Acuras 56–57, 61, 115, 121, 124, 128
 - 1-point 57
 - position 57
 - capture 121
 - Multi-point 61
 - position 61
 - operating 115
 - position 56
 - realign 128
 - undoing 128
 - realignment 124
- Acuras Multi-point 61, 65, 71
 - description 61
 - gimbal position 71
 - panel marker 65
- air flow 27
- AutoAlignment 46
 - parameters 46
 - Acuras 46
 - AutoGeometry 46
 - camera 46
- AutoAlignment Head 50
 - start up 50
- AutoGeometry 77, 85
 - Head-Up Display 85
 - definition 85
 - HUD 85
 - definition 85
 - standard channels 77
 - with blend zone 77
 - without blend zone 77
- AutoGeometry Capture: Faceted display 133
 - capture 133
- AutoGeometry: Faceted display 76, 133
 - operating 133
 - position 76
- AutoGeometry: Warp display 90
- AutoGeometry: Warp displays 90
 - position 90

B

- bracket 22–23
 - for shipping 22
 - installing shipping bracket 23
 - removing shipping bracket 23

C

- calibration 107
 - dynacolor 107
 - single projector 107
- calibration files 41–42
 - camera 42
 - spectrometer 41
- camera 42, 151, 157
 - replacing 151
 - serial number 42
- Camera 34
 - FOV 34
- camera settings 43–45
 - focus 44–45
 - lens cap 44
- capture 118, 121, 133, 137
 - Acuras 121

- AutoGeometry Capture: Faceted display 133
 - conditions 118
 - Warp AutoGeometry 137
- CE declaration 165
- class 2 laser 14
- CLO regression 116
- color alignment 112
 - dynacolor 112
- compliance 17
- configuring software 52
- connecting to a display 51
- connection diagram 40
- connections 38–39
 - LEX unit 39
 - MCU 39
 - power 38
 - AutoAlignment Head 38
 - MCU 38
 - SFTP Cat.5e cable 39
 - AutoAlignment Head 39
 - LEX unit 39
- content 19
- creating 89, 103
 - mask image 89
 - OmniBlend mask image 103

D

- defining 52, 55, 77, 85, 98
 - AutoGeometry 77, 85
 - Head-Up Display 85
 - HUD 85
 - with blend zone 77
 - without blend zone 77
 - head location 52
 - OmniBlend position 98
 - position 55
 - Acuras 55
 - AutoGeometry 55
- delete 141
 - warp realignment date 141
- deleting 131
 - acuras 131
 - realignment data 131
- description 61
 - Acuras Multi-point 61
- differences 76, 90
 - AutoGeometry: Faceted display 76, 90
 - AutoGeometry: Warp display 76, 90
- dimension 25
- display list 155
 - empty 155
- displaying 55, 145
 - OmniBlend 145
- positioning 55
 - page 55
- drivers 41
 - installation 41
- dynacolor 107, 109, 112
 - calibration 107
 - color alignment 112
 - matching multiple projectors 109
- Dynacolor 109
 - Inconsistent data 109

E

- ECR calibration 104
- EMC shielding clamps 17
- emergency stop 13
- environment condition check 12

F

Ferrites 17
FOV 34
 camera 34

G

getting started 49–52, 56, 76, 90, 96, 104, 118
 Acuras 56
 position 56
 AutoAlignment Head 50
 AutoGeometry: Faceted display 76
 AutoGeometry: Warp display 90
 configuring software 52
 connecting to a display 51
 ECR calibration 104
 eRACU 50
 gray level correction 118
 MCU 49
 OmniBlend 96
 startup 49
 AutoAlignment Head 49
 eRACU 49
 MCU 49
gimbal 162
gimbal home position 54
 setting 54
Gimbal position 64, 71
 defining 71
gimbal range 33
gray level correction 118–121
 restoring 120
 starting 119
 undoing 121

H

hardware 31
 layout 31
hardware connections 37
head location 52
 defining 52

I

Inconsistent data 109
installation 35, 37, 41, 43
 camera settings 43
 drivers 41
 hardware connections 37
Introduction 6
 Fonts 6
 symbols 6

L

laser 152
 replacing 152
laser pointer 159
layout 31
LEX unit 156
luminance 29

M

mask image 89
 creating 89
matching 109
 dynacolor 109
 multiple projectors 109
mechanical installation 35
mounting 35
moving parts 13

O

Obstructed point 76
OmniBlend 96, 98, 145–147
 blend region 98
 operating 145
 position 96
 running 146–147
OmniBlend mask image 103
 creation 103
OmniBlend page 145
OmniBlend process 145, 148
 undoing 148
operating 115, 133, 137, 145
 Acuras 115
 AutoGeometry: Faceted display 133
 OmniBlend 145
 Warp AutoGeometry 137
operating Acuras 116
 preconditions 116

P

packaging 19
 content 19
page 55
 positioning 55
 displaying 55
panel marker 65
 defining 65
Panel Marker 62
parameters 46
 AutoAlignment 46
 Acuras 46
 AutoGeometry 46
 camera 46
plug types 11
position 55–56, 76, 90, 96
 Acuras 56
 AutoGeometry: Faceted display 76
 AutoGeometry: Warp displays 90
 defining 55
 Acuras 55
 AutoGeometry 55
 OmniBlend 96
power 28
preconditions 116
projector 129
 white uniformity 129

R

range 33
 gimbal rang 33
realign 118
 conditions 118
realignment 124, 139
 Acuras 124
 warp AutoGeometry 139
related products 5
repacking 13
replace 151
 devices 151
 camera 151
 laser 151
 spectrometer 151
replacing 151–152
 camera 151
 laser 152
 spectrometer 152
requirements 25, 27–29
 access 28
 air flow 27
 dimensions 25
 environmental 25
 facility 25

- luminance 29
- power 28
- system 25
- view 28
- Restore Default Marker 64
- restoring 120
 - gray level correction 120

S

- safety 7, 10–14
 - class 2 laser 14
 - device damage 12
 - emergency stop 13
 - environment condition check 12
 - installation instructions 11
 - labels 7
 - moving parts 13
 - notice 10
 - owner's record 11
 - plug types 11
 - prevent personal injury 12
 - repacking 13
 - SFTP Cat.5e cable warning 14
 - warnings 11
- safety and warnings 10
- serial number 41–42
 - camera 42
 - spectrometer 41
- setting 54
 - gimbal home position 54
- SFTP Cat.5e cable 37
 - preparation 37
- SFTP Cat.5e cable warning 14
- shipping bracket 22–23
 - installing 23
 - removing 23
- specifications 31
- spectrometer 41, 152, 160
 - replacing 152
 - serial number 41
- start up 50
 - AutoAlignment Head 50
- starting 119, 146–147
 - gray level correction 119
 - OmniBlend 146–147
 - projector basis 146–147
- starting up the eRACU 50
- starting up the MCU 49
- Symbols 6

T

- Test Acuras Contour 64

- Test Spectrometer FOV 64
- troubleshooting 155–157, 159–160, 162–163
 - AutoAlignment Head 156
 - camera 157
 - gimbal 162
 - laser pointer 159
 - LEX unit 156
 - spectrometer 160
 - USB device detection 163
 - USB extender 156

U

- undoing 113, 121, 128, 148
 - Acuras 128
 - realign 128
 - color alignment 113
 - gray level correction 121
 - OmniBlend process 148
- Unpacking 19
- uploading 41–42
 - calibration files 41–42
 - camera 42
 - spectrometer 41
- USB device detection 163
- USB extender 156

V

- Versions 5
- vibrations 15
- view 28

W

- warp AutoGeometry 139
 - realignment 139
- Warp AutoGeometry 137
 - capture 137
 - operating 137
- warp realignment data 141
 - deletion 141
- white uniformity 129
 - factory settings 129

X

- XDS RACU 43
 - license 43
 - acuras 43
 - auto geometry 43
 - OmniBlend 43

LIST OF IMAGES

2-1	Labels: position.....	9
2-2	Labels: position.....	9
2-3	Labels: position.....	9
2-4	Labels: position.....	10
2-5	Labels: position.....	10
2-8	Emergency button + label.....	13
2-9	Moving parts warning label.....	14
2-10	Moving parts warning label.....	14
2-11	Laser warning label.....	14
2-12	Laser warning label.....	14
2-14	SFTP Cat.5e cable warning label.....	15
3-1	EMC shielding clamp.....	17
4-1	Lifting instructions: Barco (standard and rugged) version.....	19
4-2	Packaging: content of the main box.....	20
4-3	Packaging: remove the foam parts (AutoAlignment Head standard version).....	21
4-4	Packaging: remove the foam parts (AutoAlignment Head rugged version).....	22
4-5	Shipping bracket removal: standard version.....	23
4-6	Shipping bracket removal: rugged version.....	23
4-7	Orientation to fix shipping bracket: standard version.....	24
4-8	Orientation to fix shipping bracket: rugged version.....	24
4-9	Shipping bracket: standard version.....	24
4-10	Shipping bracket: rugged version.....	24
5-1	Dimension: AutoAlignment Head (standard version).....	26
5-2	Dimension: AutoAlignment Head (rugged version).....	27
5-3	AutoAlignment Head : position of air grids.....	28
6-1	AutoAlignment Head (standard version) : parts overview.....	31
6-2	AutoAlignment Head (rugged version) : parts overview.....	31
6-3	AutoAlignment Head (standard version) : parts overview.....	32
6-4	AutoAlignment Head (rugged version) : parts overview.....	32
6-5	AutoAlignment Head (standard version) : parts overview.....	32
6-6	AutoAlignment Head (rugged version) : parts overview.....	32
6-7	AutoAlignment Head (standard version) : Pan range.....	33
6-8	AutoAlignment Head (rugged version) : Pan range.....	33
6-9	AutoAlignment Head (standard version) : Tilt range.....	34
6-10	AutoAlignment Head (rugged version) : Tilt range.....	34
7-1	Lifting instructions: AutoAlignment Head (standard and rugged) version.....	35
7-6	preparation: making a loop.....	38
7-7	preparation: fixing the loop.....	38
7-8	preparation: fixing the loop at the other end of the cable.....	38
7-9	preparation: placing the cable on the warning label.....	38
7-10	preparation: fixing the warning label.....	38
7-11	preparation: fixing the warning label at the other end of the cable.....	38
7-12	Connectors: mains power (MCU).....	38
7-13	Connectors: mains power (AutoAlignment Head).....	39
7-15	Connecting SFTP Cat.5e cable to LEX unit.....	40
7-16	Connecting SFTP Cat.5e cable to LEX unit.....	40
7-17	Connection diagram.....	40
7-18	XDS RACU Server Console.....	42
7-19	Spectrometer: serial number.....	42
7-20	XDS RACU Server Console.....	42
7-21	Camera settings.....	44
7-22	Zoom: loosening the four screws.....	45
7-23	Zoom: tightening the four screws.....	45
7-24	Focus: loosening 4 thumbscrews.....	46
7-25	Focus: tightening 4 thumbscrews.....	46
7-26	AutoAlignment settings: Acuras parameters.....	47
7-27	AutoAlignment settings: AutoGeometry parameters.....	47
7-28	AutoAlignment settings: OmniBlend parameters.....	48
7-29	AutoAlignment settings: Warp AutoGeometry parameters.....	48
8-1	Starting up the MCU.....	49
8-2	Starting up the eRACU.....	50
8-3	Starting up the AutoAlignment Head.....	50
8-4	Connection dialog.....	51
8-5	Connect: button.....	51
8-6	Main page of the XDS RACU for the selected display is displayed.....	52
8-7	Activating the plugins.....	52
8-8	Options page: defining the head location.....	53
8-9	Naming the head location.....	53
8-10	Adding the head location.....	53
8-11	Selecting the head location.....	54
8-12	Renaming the head location.....	54
8-13	Saving the renamed head location.....	54
8-15	Gimbal Home Position.....	54

8-16	Gimbal reset	55
8-18	Pressing the Position Page button	56
8-19	Positioning Page is displayed.	56
8-20	Position type: Acuras 1-point	57
8-21	Creating a new position	58
8-22	Selecting the correct Head Location	58
8-23	Selecting a projector	59
8-24	Selecting spectrometer and laser	59
8-25	Laser: switch on by checking the according box	60
8-26	Gimbal control arrows	60
8-27	Transferring control to eRACU handheld unit	60
8-28	Saving the Acuras 1-point	61
8-29	Alert dialog	61
8-30	Saving a new Acuras position	61
8-31	Acuras multi point: Panel Markers	63
8-32	Acuras multi point: Panel Marker labelling	63
8-33	Acuras multi point: Panel Markers	63
8-34	Acuras multi point: panel markers (triangle)	63
8-35	Gimbal position labelling (quadrangular)	64
8-36	Gimbal position labelling (triangular)	64
8-37	Panel Markers in the quadrangular shape (Panel Marker Center is focused)	65
8-38	Position type: Acuras Multi-point	66
8-39	Creating a new position	66
8-40	Selecting the correct Head Location	67
8-41	Selecting a projector	67
8-42	Selecting spectrometer and laser	68
8-43	Panel Marker Center is focused	68
8-44	Selection: Panel Marker 2 is focused	69
8-45	Selection: Panel Marker 1 is focused	69
8-46	Selection: Panel Marker 2 is focused	69
8-47	Panel Marker Center: activated	69
8-48	Transferring control to navigation buttons on the eRACU hand held unit	70
8-49	Gimbal control arrows	70
8-50	Panel Marker Center: defined	70
8-51	Panel Marker 1-3: default position	70
8-52	Panel Marker 1-3: moved to its new position	70
8-53	Gimbal points: Gimbal Center is focused	71
8-54	Gimbal center is focused	71
8-55	Selection: Gimbal Corner 2 is selected	72
8-56	Selection: Gimbal Corner 1 is focused	72
8-57	Selection: Gimbal Corner 4 is focused	72
8-58	Gimbal Center is activated	72
8-59	Transferring control to navigation buttons on the eRACU hand held unit	73
8-60	Gimbal control arrows	73
8-63	Storing the Gimbal Center + Panel Marker Center values	74
8-64	Storing the Gimbal Center + Panel Marker Center values	74
8-65	Gimbal Center: green square	74
8-66	Gimbal side 3-4 + Panel Marker 3-4 values stored	75
8-67	Gimbal side 3-4 + Panel Marker 3-4 values stored	75
8-68	Save: button	75
8-70	Saving the new Acuras Multi-Point	76
8-71	Example: Single channel setup (Without Blend Zone)	77
8-72	Example: Multiple channels setup (Without Blend Zone)	78
8-73	Example: Multiple channels setup (With Blend Zone)	78
8-74	Position type: AutoGeometry	79
8-75	Selecting camera	80
8-76	Starting the live view	80
8-77	Creating a new position	81
8-78	Head Location: Default	81
8-79	Gimbal control arrows	82
8-80	Bad example: one of the channel corners are not within 15% of camera live view	82
8-81	Good example: channels corners within 15% of camera live view	82
8-82	Position subtype: Without Blend Zone	83
8-83	Selecting the projector(s)	83
8-84	Selecting a suitable mask	84
8-85	Masking enabled	84
8-86	Saving new position: center top	85
8-87	Alert dialog	85
8-88	Position center top saved successfully	85
8-89	Position top back saved successfully	85
8-90	Example: HUD corners in multiple channel setup	86
8-91	Position subtype: HUD	86
8-92	Head Location: Default	87
8-93	Gimbal control arrows	87
8-94	Selecting a projector	88
8-95	Selecting a suitable mask	88

8-96	Saving the HUD position	89
8-97	Position HUD saved successfully	89
8-98	Example 01: hide_bottom_right.png	90
8-99	Example 02: hide_support_right_left_plug.png	90
8-100	Enabling the Warp AutoGeometry	91
8-101	Selecting the AutoGeometry position	91
8-102	Selecting the camera	92
8-103	Starting the camera live view	92
8-104	Creating a new position	93
8-105	Selecting the AutoAlignment Head location "Default"	93
8-106	Gimbal control arrows	94
8-107	Bad example: No quadrilateral image on the position	94
8-108	Good example: One quadrilateral image on the position	94
8-109	Selecting the projector(s)	95
8-110	Saving the new position	95
8-111	Alert dialog	95
8-112	Desired position saved successfully	95
8-113	Desired position saved successfully	96
8-114	OmniBlend position: overlapping positions	97
8-115	OmniBlend position: includes some non-blend area	97
8-116	OmniBlend position: must cover screen area	97
8-117	OmniBlend position: good positioning	97
8-118	OmniBlend position: bad positioning	97
8-119	OmniBlend position: overlap region A and B defined	98
8-120	OmniBlend position: all blend regions defined	98
8-121	Selecting OmniBlend	98
8-122	Selecting a camera	99
8-123	Starting the live view	99
8-124	Creating a new position	100
8-125	Selecting correct AutoAlignment Head	100
8-126	Navigating to desired blend region	101
8-127	Selecting the projectors	101
8-128	Selecting a suitable mask	102
8-129	Masking enabled	102
8-130	Saving OmniBlend position	103
8-132	Saving OmniBlend position named test	103
8-133	Saving OmniBlend position named test_new	103
8-134	Example 01	104
8-135	Example 02	104
8-136	Pressing the Calibration button	105
8-137	Calibration page is displayed	105
8-138	Start Calibration: button	106
8-139	ECR Calibration dialog	106
9-1	Measuring the Dynacolor	108
9-3	Applying the measured value	109
9-4	Desired values calculated	110
9-6	Desired values applied successfully to all projectors	111
9-7	Desired white point values applied successfully to the selected projector	111
9-8	Stating the color alignment process	112
9-12	Desired values applied successfully to all projectors	113
9-14	Pressing the Undo Color Alignment	113
9-15	Selecting the undo options	114
9-16	Undo color alignment process completed	114
10-1	Acuras page	115
10-2	Realign: reduced targets dialog box	116
10-3	Realign: regain targets dialog box	117
10-4	CLO regression principle	117
10-5	Capture: maximum dimmer	118
10-6	Gray Level Correction page	119
10-7	Gray Scale dialog	120
10-8	Acuras dialog: head location "H1"	120
10-9	Gray Level Correction process is started	120
10-11	Acuras dialog: restoring the Gray Level Correction values	121
10-12	Acuras dialog: undoing the Gray Level Correction values	121
10-14	selecting the desired projector(s)	122
10-15	group selected	122
10-16	Start Capture button	123
10-17	Feedback window: Spectrometer calibration file is missing	123
10-18	Acuras dialog	123
10-20	Acuras capture process in progress	124
10-22	Simple Acuras	124
10-23	Advanced Acuras 1	125
10-24	Advanced Acuras 2	125
10-25	Advanced Acuras 3	125
10-26	Activating a golden alignment set	126
10-27	Selecting the desired projector(s)	126

10-28	Group selected	126
10-29	Example: selecting the desired realignment setting	127
10-30	Pressing the Start Realignment button	127
10-31	Acuras dialog	127
10-33	Acuras realignment process in progress	127
10-35	Undo changes after Acuras realign	128
10-36	Selecting the desired projector(s)	128
10-37	Group selected	128
10-38	Pressing the Undo Changes button	129
10-39	Acuras dialog	129
10-40	Acuras undo realignment process completed	129
10-42	Activating a Golden Alignment set	130
10-43	Selecting the desired projector(s)	130
10-44	Group selected	130
10-45	Initiating the white uniformity process	130
10-46	White Uniformity dialog: Selecting an option	131
10-47	White uniformity factory settings of all projectors restored successfully	131
10-48	Delete Acuras Realign	131
10-49	Selecting the desired Golden Alignment set	132
10-51	Acuras realignment data deleted	132
11-1	Pressing the AutoGeometry button	134
11-2	AutoGeometry page is displayed	134
11-3	All projectors selected	134
11-4	Starting the AutoGeometry capture process	135
11-5	AutoGeometry: dialog	135
11-7	AutoGeometry capture process in progress	135
12-2	All projectors selected	138
12-3	Starting the capturing process	138
12-4	Group selected for Warp Capturing	138
12-6	Warp AutoGeometry Capture process completed	139
12-8	All projectors selected	139
12-9	Starting the realignment process	140
12-10	Group selected for the realignment process	140
12-12	Warp Realignment process is in progress	140
12-13	Storing the realigned data on the projector(s)	141
12-17	Selecting a projector	142
12-18	Stating the deleting process	142
12-19	Selecting the projector	142
12-20	Selecting an eyepoint and setting the check box	142
12-21	Pressing the Delete button	142
12-22	Eyepoint is deleted	143
13-3	OmniBlend page is displayed	146
13-4	Selecting the projectors	147
13-5	Selecting the group	147
13-6	Starting the OmniBlend process	147
13-8	Interrupting the OmniBlend process	147
13-9	Activating the position selection section	148
13-10	Selecting the position	148
13-11	Starting the OmniBlend process	148
13-13	Interrupting the OmniBlend process	148
13-14	Selecting the projectors	149
13-15	Selecting the group	149
13-16	Selecting the position	149
13-17	Pressing Undo button	149
13-18	Starting the OmniBlend undo process	149
14-2	Section: Camera	151
14-3	Selecting old camera	151
14-4	Confirming the camera replacement	152
14-5	Section: Spectrometer	152
14-6	Selecting old spectrometer	152
14-7	Confirming the spectrometer replacement	152
14-8	Section: Laser	153
14-9	Selecting old laser	153
14-10	Confirming the laser replacement	153
15-1	Windows > Start > Run	155
15-2	Run > Cmd	155
15-3	Ipconfig /flushdns	155
15-4	DNS cache flushed	156
15-5	LEX unit: LED's	156
15-6	Camera settings	157
15-7	Camera: USB cable	158
15-8	Camera: detected by Windows OS	158
15-9	Laser pointer: USB cable (AutoAlignment Head standard version)	159
15-10	Laser pointer: USB cable (AutoAlignment Head rugged version)	159
15-11	Laser pointer: detected by Windows OS	160
15-12	Laser pointer: USB properties	160

15-13	Spectrometer: USB cable (AutoAlignment Head standard version).....	161
15-14	Spectrometer: USB cable (AutoAlignment Head rugged version).....	161
15-15	Spectrometer: detected by Windows OS.....	161
15-16	Gimbal connector: AutoAlignment Head standard version	162
15-17	Gimbal connector: AutoAlignment Head standard version	162
15-18	Laser pointer: detected by Windows OS	163
15-19	Gimbal: USB properties.....	163